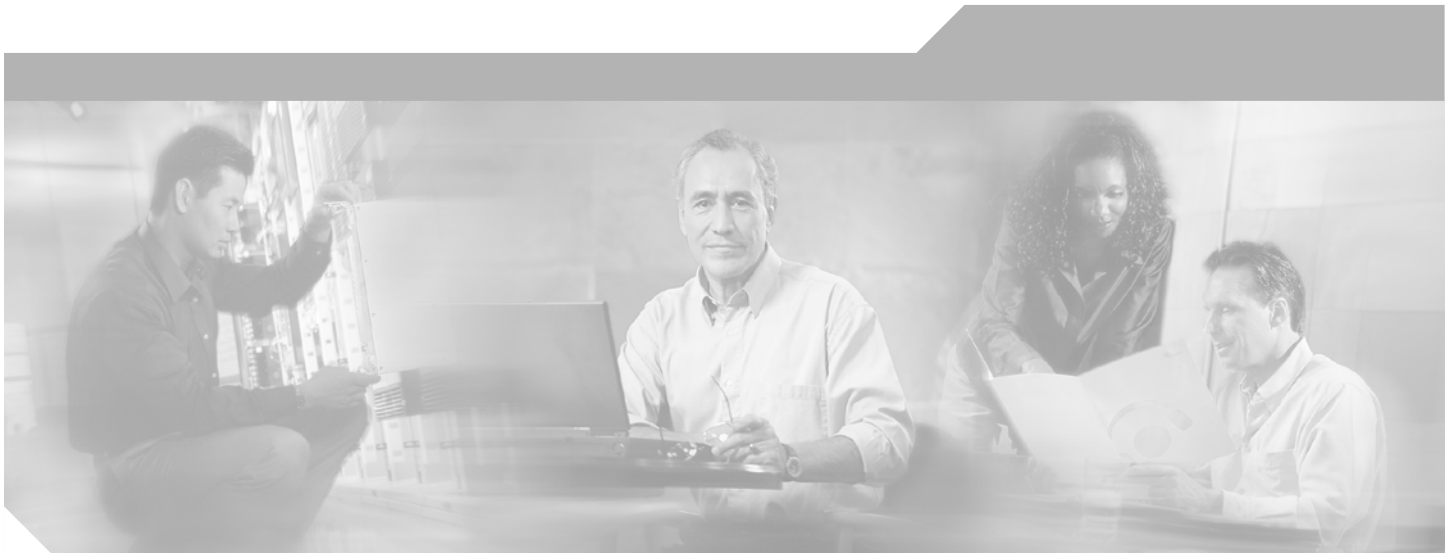

Cisco Media Gateway Manager 5.0 User Guide

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GLOSSARY

INDEX

Preface

The *Cisco Media Gateway Manager 5.0 User's Guide* describes how to use the Cisco Media Gateway Manager (Cisco MGM) 5.0 software.

Changes to the User Guide

This User Guide is updated as follows:

- Part numbers for VXSM Front and Back cards updated. See Table 1-1.

Audience

This guide is designed for system administrators and users who are responsible for the operation of the Cisco MGM application.

Documentation

A *Guide to Cisco Multiservice Switch Documentation* ships with your product. That guide contains general information about how to locate Cisco MGX and Cisco MGM documentation online.

Technical Manual Order of Use

Use the technical manuals in the following order:

Step 1 Refer to the documents that ship with your product. Observe all safety precautions.

Step 2 Refer to the release notes for your product.

Step 3 Refer to this manual for planning information.

Step 4 Refer to the manuals for information about installing cards and cables in the MGX chassis.

Step 5 Refer to the manuals that help you configure your MGX switch and processor cards.

Step 6 Refer to the manual that supports the additional cards you intend to install in your switch. For example, the VISM book can help you set up your switch as a voice gateway, and the RPM book can help you implement IP on the switch.

Step 7 Additional books, such as command reference guides and error message books, can help with the daily operation and maintenance of your switch.

Technical Manual Titles and Descriptions

Table 1 lists the technical manuals and release notes that support this release.

Table 1 Technical Manuals and Release Notes for Cisco Media Gateway Manager

Document Title and Part Number	Part Number	Description
Release Notes for Cisco Media Gateway Manager 5.0	OL-5464-01	Provides new feature and compatibility information, as well as information about known and resolved anomalies.
Cisco Media Gateway Manager 5.0 Installation Guide	OL-5460-01	Provides procedures for installing Release 5.0 of the Cisco MGM element management system.
Cisco Media Gateway Manager 5.0 User Guide	OL-5461-01	Describes how to use the Cisco MGM 5.0 software, which consists of user applications and tools for network discovery, network configuration, connection management, fault management, system administration, and security management. **Note** The Cisco MGM interface has built-in documentation support in the form of Online Help. On a PC, press **F1** to access Help; on a UNIX workstation, press the **Help** key. Alternatively, on either system you can select **Help** from the main or popup menu.
Cisco Media Gateway Manager 5.0 GateWay/CORBA User Guide and Programmer Manual	OL-5465-01	Describes the Cisco MGM GateWay/Common Object Request Broker Architecture (CORBA) Northbound Interface Release 5.0 product that is available for Cisco MGM 5.0.A reference for developers of operations support system (OSS) applications that work with the Cisco MGM GateWay/CORBA interface.
High Availability Installation Guide for Cisco Media Gateway Manager 5.0	OL-5462-01	Explains how to install Cisco Media Gateway Manager 5.0 (Cisco MGM) in a high availability (HA) environment.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

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You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/index.shtml

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

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You can send comments about technical documentation to bug-doc@cisco.com.

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Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

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For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- The Cisco *Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:

  http://cisco.com/univercd/cc/td/doc/pcat/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Introduction

This chapter describes Cisco Media Gateway Manager, and gives a basic sequence of tasks to get started. It contains the following sections:

- 1.1 What Is Cisco Media Gateway Manager?
- 1.2 What Are the NE Modules Supported by Cisco MGM?
- 1.3 What Are the Key Features of Cisco MGM?
- 1.4 A Typical Workflow in Cisco MGM

1.1 What Is Cisco Media Gateway Manager?

Cisco Media Gateway Manager (Cisco MGM) is the element management system for the Cisco MGX 8880 Media Gateway and voice enabled Cisco MGX 8850 Multiservice Switch for voice solutions based on VoIP technologies. Cisco MGM supports fault, configuration, performance, and security management functional areas. Cisco MGM also serves as a foundation for integration into a larger overall operations support system (OSS) environment by providing northbound gateway interfaces to higher layer management systems.

Cisco MGM 5.0 includes the following components:

- Cisco MGM 5.0
- Cisco MGM CORBA/GateWay
- Cisco MGM High Availability

Cisco MGM GateWay is an architectural component that provides EMS-to-network management system (NMS) interface mediation. Cisco MGM GateWay enables service providers to integrate Cisco MGM with their Operations Support Systems (OSSs) by using open, standard TMF interfaces. Cisco MGM offers Common Object Request Broker Architecture (CORBA) interface options for alarm forwarding.

The Cisco MGM high availability solution provides automatic failover for specific software and single hardware failures without the need to reconfigure IP addresses on your switched/router network.

Note In Cisco MGM, the GateWay/CORBA and high availability functionalities are sold separately.

1.2 What Are the NE Modules Supported by Cisco MGM?

Table 1-1 lists the modules in the MGX8880 chassis and the MGX8850 chassis that can be managed by the element management functions provided by Cisco MGM Release 5.0.

Table 1-1 MGX8880 and MGX8850 Modules and Cards

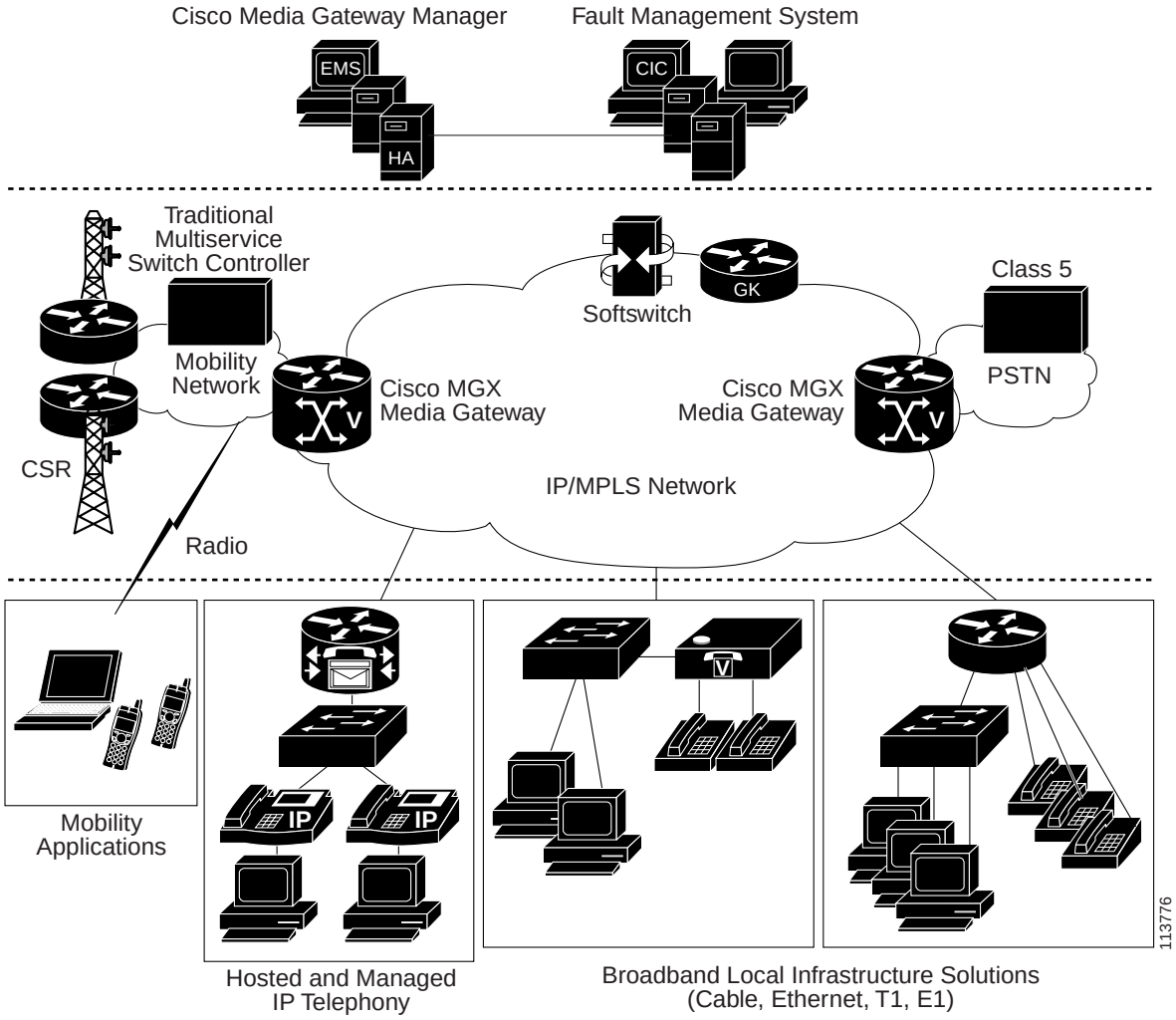
Module	Front Card	Back Card
PXM45	PXM45/B	PXM-UI-S3
		PXM-HD
	PXM45/C	PXM-UI-S3/B
		PXM-HD
RPM-PR	MGX-RPM-PR-256	MGX-RJ45-4E/B
		MGX-RJ45-FE
		MGX-MMF-FE
RPM-XF	MGX-RPM-XF-512	MGX-1OC12POS-IR
		MGX-1GE
		MGX-2GE
		MGX-2OC12POS
AXSM/B	AXSM-16-T3E3/B	SMB-8-T3
		SMB-8-E3
	AXSM-16-155/B	MMF-8-155-MT/B
		SMFIR-8-155-LC/B
		SMFLR-8-155-LC/B
		SMB-4-155
	AXSM-4-622/B	SMFIR-2-622/B
		SMFLR-2-622/B
	AXSM-1-2488/B	SMFSR-1-2488/B
		SMFLR-1-2488/B
AXSME	AXSM-32-T1E1-E	MCC-16-E1
		RBBN-16-T1E1
VXSM	MGX-VXSM-4-155	VXSM-BC-4-155
	MGX-VXSM-T1E1	VXSM-BC-24T1E1
VXSM redundant backcard		VXSM-R-BC
RCON-1TO5-8850		

Table 1-1 MGX8880 and MGX8850 Modules and Cards (continued)

Module	Front Card	Back Card
VISM-PR	MGX-VISM-PR-8T1	AX-RJ48-8T1
		AX-R-RJ48-8T1
	MGX-VISM-PR-8E1	AX-RJ48-8E1
		AX-R-RJ48-8E1
		AX-SMB-8E1
		AX-R-SMB-8E1
SRME/B	MGX-SRME/B	MGX-SMFIR-1-155
		MGX-STM1-EL-1
		MGX-BNC-3T3-M
SRME	MGX-SRME	MGX-SMFIR-1-155
		MGX-STM1-EL-1

Cisco MGM provides a comprehensive management solution as illustrated in Figure 1-1.

Figure 1-1 Cisco MGM Comprehensive Management Solution



1.3 What Are the Key Features of Cisco MGM?

Cisco MGM provides the following key features:

- An intuitive Java-based graphical user interface (GUI) that provides a native “look-and-feel” on both Microsoft Windows and Sun Solaris client platforms
- User-defined domain explorer network views with “bubble-up” alarm severity propagation and drill-down capabilities to isolate fault conditions and service-delivery impact
- Geographic Network Maps and explorer views that reflect the physical layout and configuration of the network
- Alarm Browser and Alarm Log views that provide a listing of all current and historical alarms and events
- A desktop-resident dashboard that provides alarm status for the Cisco MGM user’s entire span of control with quick access to the Domain Explorer and the Alarm Browser

- Diagnostic capabilities using the Diagnostic Center
- Real-time network surveillance with configurable popup alarm and event notifications
- Real-time shelf views with full alarm and operational status indicators
- Automated configuration backup with manual restore capabilities, plus remote software download capability across the entire network domain
- GUI-based NE configuration
- Extensive performance monitoring (PM) statistics collected for display or export
- Custom profiles that can be used to grant separate permissions for various Cisco MGM operation
- Comprehensive security management providing flexible user access
- High-availability solution includes seamless client re-connect on switch over, database and disk redundancy, and automatic reconnection to the network elements
- Cisco MGM 5.0 supports northbound integration (based on SNMP) with Cisco Info Center
- Northbound CORBA gateway for fault and inventory management
- Northbound SNMP-based integration with Cisco Info Center

1.4 A Typical Workflow in Cisco MGM

The following sections give brief details of the steps needed to get started with Cisco MGM. More details are available in the other chapters in this User Guide.

A typical workflow in Cisco MGM is:

- 1.4.1 Starting and Stopping the Cisco MGM Server
- 1.4.2 Adding a User
- 1.4.3 Adding a New Group
- 1.4.4 Adding a Network Element

The element management functions of Cisco MGM are divided into the following categories.

- Network elements—Manages the network nodes and their components.
- Fault management—Detects, isolates, corrects, and reports faults for the NE and service.
- Configuration management—Configures and controls NEs, identifies resources, collects information about a resource, and manages intra-chassis connections between NEs.
- Performance management—Gathers and reports the behavior of NEs, network, and services, including quality assurance, monitoring, management control, and analysis.
- Security management—Prevents and detects any improper use of network resources and services as well as recovery from security violations.
- Connections—Manages the connections within the nodes.

By managing network elements with the Configuration Center, you can:

- Configure numerous managed device objects, such as configuration settings, interface status, counter values, and so forth in a Cisco network.
- Display and modify the values for the objects.
- Perform tasks, such as supporting connections, displaying statistics, and setting up controllers and partitions.

Table 1-2 describes the tools you will use to get started:

Table 1-2 Getting Started Tools

Item	Tool	Description
Create a New User		Displays the Create New Cisco Media Gateway Manager User wizard, which allows you to add a new user.
Add a New Group		Displays the New Group dialog box. From here, you can add a new user group, give the group a name, and provide a brief description of the group.
Add Network Element(s)		Displays the Add Network Element(s) wizard, which allows you to add a new network element.

1.4.1 Starting and Stopping the Cisco MGM Server

A complete set of administrative command scripts is added to the application during installation. One command automatically starts the Cisco MGM server processes every time the server is started. The server processes can also be started or stopped manually as necessary; the scripts are located in the /opt/CiscoMGMServer/bin directory.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

The **mgms-start** command sets the appropriate environment variables and starts the Cisco MGM server. The amount of time it takes for the Cisco MGM server to start varies based on the number of network elements (NEs) in the configuration and the size of the database. Use **mgms-start** only when the Cisco MGM server has stopped.

To start the Cisco MGM server:

Step 1 Log into the Cisco MGM server workstation as the root user.

Step 2 On the command line, enter the following:

```
mgms-start
```

Note Use the **showmgm** command from the CLI to view processes or services that are running in the Cisco MGM server.

The **mgms-stop** command stops the Cisco MGM server. The stop procedure shuts down the server and cleans all memory and connections. The overall process takes less than five minutes.

To stop the Cisco MGM server:

Step 1 Log into the Cisco MGM server workstation as the root user.

Step 2 On the command line, enter the following:

```
mgms-stop
```

1.4.2 Adding a User

When Cisco MGM is installed, the System Administrator must create users, who can then perform tasks such as adding network elements.

To add a new Cisco MGM user, go to the Domain Explorer window and choose **Administration > Cisco MGM Users**. In the Cisco Media Gateway Manager Users window, click the **Create a New User** tool, or choose **Edit > Create**. Follow the prompts to create a new user.

Note You must set the appropriate user privilege for each new user.

1.4.3 Adding a New Group

Groups are a collection of groups or collection of NEs. NEs are often grouped geographically or by domain. Groups can be used to organize the domain into a hierarchy. A Network Map can be opened for a group.

After installing the Cisco MGM server and client, complete the following steps:

Step 1 Log into the Cisco MGM client with the appropriate user access profile.

Step 2 In the Domain Explorer window, click the **Add a New Group** tool, or choose **File > New Group** and add one or more groups to the tree:

a. Enter a group ID.

b. Enter a group location.

c. Enter a group description.

d. Click **OK**.

1.4.4 Adding a Network Element

To add a network element (NE):

Step 1 In the Domain Explorer window, click the **Add Network Element(s)** tool, or choose **File > Add Network Element(s)**.

Step 2 Enter the requested information.

Change the operational state for the NE to In Service.

Make sure you entered the IP address correctly.

Step 3 Click **Finish**.

Step 4 (Optional) Add more network elements.

Note Wait two to five minutes while the Cisco MGM server completes the node discovery.

Step 5 Check to see if the connectivity state is correct. If Cisco MGM cannot connect to the network element, the network element displays an unavailable connectivity state in the Domain Explorer topology tree. If there is a connectivity problem, try to diagnose the connectivity configuration.

Basic Concepts

This chapter covers the details the basic concepts of Cisco MGM, including the following topics:

- 2.1 How Do I Navigate within Cisco MGM?
- 2.2 What Basic Functions Can I Perform in Cisco MGM?
- 2.3 What Are the General Features of Cisco MGM?

2.1 How Do I Navigate within Cisco MGM?

This section helps you understand Cisco MGM navigation tools and actions, including:

- 2.1.1 Using the Domain Explorer
- 2.1.2 Navigating Physical Views
- 2.1.3 Using Network Maps
- 2.1.4 Using Control Panel
- 2.1.5 Using Wizards
- 2.1.6 Paging through Data
- 2.1.7 Finding Data
- 2.1.8 Navigating the Client Desktop
- 2.1.9 Using Mnemonics
- 2.1.10 Using the Online Help
- 2.1.11 Using the Pin Tool

Note When you switch to a different program and then return to Cisco MGM, the Cisco MGM dialog boxes might be hidden behind another Cisco MGM window or dialog box. The Cisco MGM client might appear frozen because the hidden dialog box requires user action. On a Windows workstation, press **Alt-Tab** to display all running processes. Continue to press **Tab** (while keeping **Alt** depressed) to select the icon for the Java process. This will position the Cisco MGM dialog box as the top active window. On a Solaris workstation, minimize the open windows until the Cisco MGM dialog box is visible.

2.1.1 Using the Domain Explorer

The Domain Explorer is the Cisco MGM home window and provides a logical view of the network plus alarm, connectivity, and operational status.

The Domain Explorer displays a hierarchical view of all NEs and groups currently being monitored by Cisco MGM. Domain Explorer windows are divided into two sections: a tree (at left) and a pane (at right). The tree organizes the resources (domain, groups, and NEs), which are displayed in a hierarchical format. The top level of the hierarchy is the management domain, followed by groups and NEs. You can access information about each resource by browsing the tree section. The pane provides specific information about the selected object.

Tip The Domain Explorer only provides a high-level view of the network. To view the entire managed network, access the Physical View hierarchy tree from the Configuration Center, Chassis View, Statistics Report, or Diagnostic Center.

To check the connection status of a selected NE, run a diagnostic check at the node level in the Diagnostic Center. See 5.2.10.2 Running a Diagnostic Check at the Node Level.

Note You can drag and drop NEs to reposition them in the topology tree.

The Domain Explorer has three properties panes:

- 2.1.1.1 Management Domain Properties, page 2-2
- 2.1.1.2 Group Properties, page 2-4
- 2.1.1.3 Network Element Properties, page 2-5

Tip See Appendix A, “Icons and Menus” for an explanation of the Domain Explorer legend and icons.

2.1.1.1 Management Domain Properties

The Management Domain Properties pane displays information about the management domain that is currently selected in the Domain Explorer tree. The Cisco MGM management domain consists of all the NEs managed by the Cisco MGM server where the Cisco MGM client connects.

The management domain can also contain groups that give you the flexibility to subdivide the domain you are monitoring. For example, a group can represent all NEs within a geographical location.

To display all of the first-level nodes under the management domain, click the expand icon (+) next to the management domain name in the topology tree. If any of the groups or NEs have an alarm condition, an icon representing that condition is displayed next to the management domain name.

The Management Domain Properties pane has two tabs: Status and Identification.

2.1.1.1.1 Status Tab

Table 2-1 describes the Status tab fields.

Table 2-1 Field Descriptions for the Status Tab

Field	Description
Domain Name	User-defined name of the management domain.
Description	User-defined description of the management domain.
Total NEs	Total number of NEs within the management domain.
Unavailable NEs	Number of NEs within the management domain that Cisco MGM cannot currently connect to.
NEs in Alarm	Total number of NEs within the management domain that have an active alarm.
Unmanaged NEs	Total number of unmanaged NEs within the management domain.
Alarm Status	Total number of NE and EMS alarms by severity. In addition, this field lists how many of the total NEs with active alarms are experiencing a critical, major, minor, or warning alarm. **Note** If the same NE is experiencing more than one type of alarm simultaneously, that NE is counted for each severity level.
NE Count by Operational State	Total number of NEs within the management domain according to operational state: • In Service: The NE is currently deployed and requires monitoring. • Out of Service: The NE has been marked out of service and does not require monitoring. • NEs In Initialization: The NE is initializing, and you can perform the following actions: – Open the Alarm Browser and Alarm Log. – Open the PM tables. • Under Maintenance: The NE is temporarily under maintenance but requires monitoring. • NEs in Sync Configuration: The NE is in Sync Configuration state, and you can perform the following actions: – Open the Alarm Browser and Alarm Log. – Open the PM tables.

2.1.1.1.2 Identification Tab

Table 2-2 describes the Identification tab fields.

Table 2-2 Field Descriptions for the Identification Tab

Field	Description
Domain Name	Name of the management domain.
Description	Description of the management domain.
EMS ID	EMS ID (Cisco Media Gateway Manager).
Server	Name or IP address of the Cisco MGM server to which the user is connected.
Vendor Name	Vendor name (Cisco Systems).
Software Version	Cisco MGM release that is running.

2.1.1.2 Group Properties

The Group Properties pane displays information about the group that is currently selected in the topology tree.

A group consists of other groups or NEs. Groups give you the flexibility of subdividing the management domain you are monitoring. For example, a group can represent all NEs within a geographical location.

Click the expand icon (+) next to a group in the topology tree to view the objects that are assigned to that group. The same group can have multiple instances in the topology tree. The contents of all instances of a group are always the same. Any changes to one instance of a group will be reflected in all instances of that group.

You can add and delete groups; however, the option to delete a group is not available until all objects are removed from the group. If the group has multiple instances in the topology tree, you can delete all but the last instance of the group.

The Group Properties pane has two tabs: Status and Identification.

2.1.1.2.1 Status Tab

Table 2-3 describes the Status tab fields.

Table 2-3 Field Descriptions for the Status Tab

Field	Description
Group ID	User-defined name of the selected group.
Description	User-defined description of the selected group.
Total NEs	Total number of NEs within the selected group.
Unavailable NEs	Number of NEs within the selected group that the Cisco MGM server cannot currently reach.
NEs in Alarm	Total number of NEs within the selected group that currently have an active alarm.
Unmanaged NEs	Number of NEs within the selected group that are currently unmanaged.
Alarm Status	Total number of alarms within the selected group, by severity. In addition, this field lists how many of the total NE alarms have a critical, major, minor, or warning status. If the same NE experiences more than one type of alarm simultaneously, that NE is included in the count for each severity level.
NE Count by Operational State	Total number of NEs within the selected group according to operational state. Values are In Service, Under Maintenance, and Out of Service. Also shows the number of NEs within the selected group that are initializing or synchronizing their configuration.

2.1.1.2.2 Identification Tab

Table 2-4 describes the Identification tab fields. Only users with the appropriate user access profile can edit these fields.

Table 2-4 Field Descriptions for the Identification Tab

Field	Description
Group ID	Unique user-defined name of the selected group.
Description	User-defined description of the selected group.
Location Name	User-defined geographic location of the selected group.

2.1.1.3 Network Element Properties

The Network Element Properties pane displays information about the NE that is currently selected in the tree. An NE represents a Cisco MGX 8880 or a Cisco MGX 8850.

The same NE can have multiple instances in the tree. The contents of all instances of the same NE are always the same. Any changes to one NE instance are reflected in all instances of that NE. Regardless of the number of instances an NE has in the tree, you can delete one or all instances of that NE. When the final instance of an NE is deleted, the deleted NE moves to the Deleted NEs group.

The Network Element Properties panes for most NEs have the following tabs: Status, Identification, and NE Authentication.

2.1.1.3.1 Status Tab

Table 2-5 describes the Status tab fields.

Table 2-5 Field Descriptions for the Status Tab

Field	Description
NE ID	Name of the selected NE.
Description	Information that a user entered to describe the NE.
NE Model	Model of the selected NE.
Alarm Status	Total number of critical, major, minor, and warning alarms currently existing on the selected NE.
Communication State	Current communication state of the selected NE (Available or Unavailable).
Operational State	Current operational state of the selected NE. You can change the operational state.
PM Collection	You can enable or disable PM data collection.

2.1.1.3.2 Identification Tab

Table 2-6 describes the fields in the Identification tab.

Table 2-6 Field Descriptions for the Identification Tab

Field	Description
NE ID	Name of the selected NE.
Description	Information that a user entered to describe the NE. You can edit this field.
NE Model	Model of the selected NE.
NE Type	Type of NE. You can edit this field.
Vendor Name	Vendor name.
Software Version	Software version that is running on the NE.
Active IP Address	Active IP address of the selected NE.

2.1.1.3.3 NE Authentication Tab

The NE Authentication tab allows you to specify usernames and passwords for Cisco MGM server. Table 2-7 describes the fields in the NE Authentication tab. Fields shown depend on the type of NE selected.

Table 2-7 Field Descriptions for the NE Authentication Tab

Field	Subfield	Description
MGM Server - NE Connection	NE Service Level Username	Username that the Cisco MGM server uses to connect to NEs.
	NE Service Level Password	Password to use for Cisco MGM server-to-NE connections.
	Confirm NE Service Level Password	Re-enter the password to confirm it.
	SNMP Community String	Community string name used in SNMP messages. You must provide the community string name to give the user SNMP read access to the device. This field is unavailable if it does not apply to the selected NE.
	SNMP Set Only Community String	Community string used in SNMP messages for setting the attributes on the device.

2.1.2 Navigating Physical Views

The Physical View is a hierarchical tree that can be found in certain Cisco MGM applications; namely, the Chassis View, Statistics Report, Configuration Center, and Diagnostic Center (for details about these applications, see section 2.3 What Are the General Features of Cisco MGM?, page 2-14.)

The Physical View shows the entire managed network. To expand or minimize the hierarchy, click the looking glass icon next to any node. Nodes are color-coded to represent the highest severity alarm on each node.

2.1.3 Using Network Maps

The Network Map window allows you to display how the network is partitioned graphically. It is organized into a multilevel hierarchy that corresponds to the structure of the Domain Explorer trees. The Network Map hierarchy consists of management domains, groups, and NEs, which are displayed graphically.

You can launch the Network Map either by clicking on the **Open Network Map** tool in the Domain Explorer toolbar, or by choosing **File > Network Map**. A map appears with individual groups and NE icons.

Double-clicking a group expands that group to show its contents. Clicking **Show Parent Network Map** returns you to the parent map. When you launch the Network Map from a particular group in the Domain Explorer, the Network Map opens with the contents of the group displayed.

After zooming in on a region on the map, scroll bars at the bottom and right side of the screen allow you to pan the view to a different region. You can also use the focus box in the top left panel to pan and zoom the view. All groups are shown on a single map, and it is the zoom level and pan position that determine what groups are visible at any time. Depending on the selected layer rate, certain NEs are shown. You can open multiple map windows to compare different views.

Note Sometimes one node can overlap another in the maps. This occurs when a new node is added and other existing nodes have already been assigned a location. The solution is to change the layout to make sure that no two nodes are overlapping.

All groups, NEs, and labels are zoomed when you zoom in or zoom out. Cisco MGM allows you to save the zoom level and framing of the map. Also, you can specify a fixed pixel size for icons so that regardless of the zoom level, the map icon size does not change. By default, the icon size is variable based on the zoom level. The icon size setting is saved with the other map settings.

When you open the Network Map from an NE in the Domain Explorer, the selected NE is centered on the map.

Note The Refresh Data tool in the Network Map toolbar flashes when updates are available.

The following scenarios describe the actions of the Refresh Data tool in the Network Map toolbar.

- The Refresh Data tool flashes when:
  - The map background is changed
  - The topology structure changes (a node is added or deleted) in a group or area
  - A node is forced invalid
- The Refresh Data tool does not flash when:
  - The alarm counts change on the node
  - The node connectivity state changes
  - The node admin state changes
  - The node name changes
  - The node data properties change
  - The discovery state changes
  - The data reference changes

2.1.4 Using Control Panel

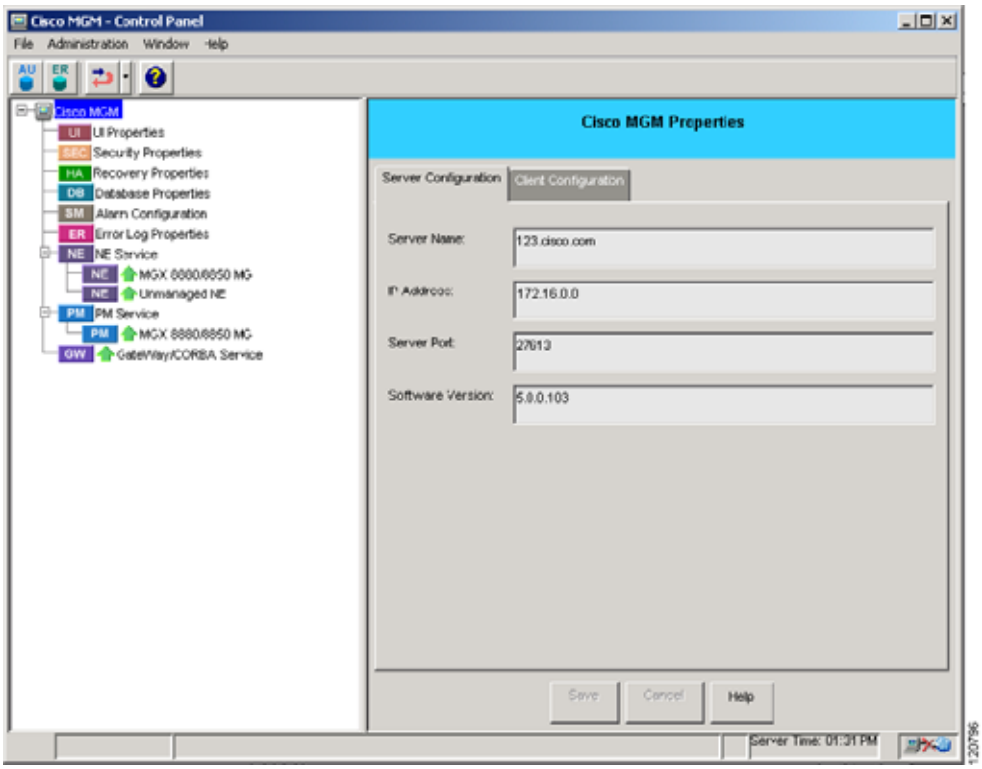
Most client and server configuration parameters are viewed and modified in the Control Panel window. To view the Control Panel, choose **Administration > Control Panel** in the Domain Explorer. The left side of the window displays the tree, which contains the following Cisco MGM functions and services:

- UI Properties—for Fault Management and Domain Management
- Security Properties—for Password Aging, Maximum Retries, Login Disable Period and Client Inactivity Timer Settings
- Recovery Properties—for Session Recovery and Process Monitoring using High Availability

- Database Properties—for Configuration, Pruning and Database Backup
- Alarm Properties—for Threshold EMS Alarms and Non Threshold EMS Alarms
- Error Log Properties—for the Cisco MGM Server and Gateway/SNMP, SM Service and SNMP Trap Service
- NE Service—for NE Poller, NE AutoBackup and NE Manual Backup
- PM Service—for PM Status and Properties
- Gateway CORBA Service—for Global and OSS Clients

The right side of the window displays the property sheet that corresponds to the selected client or server component. See Figure 2-1.

Figure 2-1 Control Panel



2.1.5 Using Wizards

Wizards are used to guide users through complex operations. Each wizard presents a sequence of dialog boxes which the user can move forward and backward through, filling in the details required by choosing radio buttons, checking boxes and entering information by keyboard.

In Cisco MGM, wizards are used to simplify involved configuration management tasks such as:

- NE user access administration
- Broadcast software download
- Native equipment/facility provisioning

- Topology management
- Automatic NE memory backup, on-demand restoration
- General operation on multiple NEs

2.1.6 Paging through Data

Some Cisco MGM tables return large numbers of rows. To support large tables, Cisco MGM provides a paging feature. If more than 1,000 rows of data are returned, data is grouped in pages of up to 1,000 rows. You can page forward and page back to view the entire set of data.

2.1.7 Finding Data

There are two methods of finding data in Cisco MGM:

- 2.1.7.1 Finding Data in the Domain Explorer, page 2-9
- 2.1.7.2 Finding Data in the Diagnostic Center, Statistics Report, Chassis View, and Configuration Center, page 2-9

2.1.7.1 Finding Data in the Domain Explorer

In the Domain Explorer window, use the **Edit > Find** dialog box to search for NEs or groups. To search for a particular NE or group, specify the NE or group name, IP address, or description. The search always starts from the root node and returns to the root node after reaching the last node.

2.1.7.2 Finding Data in the Diagnostic Center, Statistics Report, Chassis View, and Configuration Center

In the Diagnostics Center, Statistics Report, Chassis View, and Configuration Center, enter the object name or the IP address in the text box at the left side of the window above the Hierarchy tree. The object name or IP address can be entered in full or partially. Click the **Find** button. If found, the Hierarchy Tree displays the node or the trunk. If there are multiple matches, click the **Find Next** or **Find Previous** button to show the next node or trunk.

2.1.8 Navigating the Client Desktop

The client desktop provides a menu bar and a toolbar that correspond to the principal Cisco MGM applications. You click on a particular icon to launch the corresponding application you need for element management, monitoring, report generation, and administrative tasks. You can launch all applications from the menu bar or you can right-click a specific object and choose the popup menu option.

All objects can be moved from one application to another.

Appendix A, “Icons and Menus” describes the icons and menus used in Cisco MGM.

2.1.8.1 Using Popup Menus

The popup menus are available from any application.

The popup menu options are enabled based on your security profile. To display the popup menus, you can right-click from the following options:

- Away from the network in Graphical View.
- A network from the Hierarchical Tree or Graphical View.
- A node from the Hierarchical Tree or Graphical View.
- A card, line, path, or port from the Hierarchical Tree or Graphical View.

Table 2-8 describes the popup menu options available in Configuration Center, Diagnostic Center, Chassis View, and Statistics Report applications.

Table 2-8 Popup Menu Options in Configuration Center, Diagnostic Center, Chassis View, and Statistics Report applications

Option	Description
Chassis View	Launches Chassis View after you select a node from the Hierarchical Tree.
Configuration Center	Launches Configuration Center with or without selecting an object.
Diagnostics Center	Launches Diagnostics Center. You must select an object from the Hierarchical Tree.
Statistics Report	Launches the Statistics Report Tool with or without selecting an object.
Administration	
Cisco MGM Audit Trail	Launches Cisco MGM Audit Trail to view the audit trail viewer.
Telnet	Establishes a telnet session with the switch.
SSH[1]	Connects to a node by using a secured shell.
View Management	
Sort	Sorts the tree.

1. SSH = secured shell

2.1.9 Using Mnemonics

All Cisco MGM menus and menu options have a uniquely assigned mnemonic to support keyboard access to menu items in addition to the mouse. For example, to exit the Cisco MGM application, enter **Alt+f** (for the File menu); then, enter **x** (Exit).

2.1.10 Using the Online Help

The online help provides a detailed explanation of each Cisco MGM GUI window and dialog box.

To view the online help for the current Cisco MGM window, you have two options:

- Choose **Help** > **Current Window**
- Click the **Help** tool.

To view the online help for any Cisco MGM dialog box, click the **Help** tool within the dialog box.

Tip Use the print option in the browser that displays the online help to print the selected page.

2.1.11 Using the Pin Tool

The Dashboard, Configuration Center, Diagnostic Center, Chassis View, and Statistics Report applications have a pin tool. The pin point is up when the tool in *pinned up*, and down when the tool is *pinned down*. The function of the pin tool differs depending on where it is used:

- If you click the pin tool in the Dashboard window, the window is pinned down, meaning that it is not brought to the foreground by default. If you click the pin tool again, the Dashboard window is pinned up, meaning that it is brought to the foreground each time an update occurs (alarm counts change, NE count changes, and so on).
- If you click the pin tool in the Configuration Center, Diagnostic Center, Chassis View, and Statistics Report windows, that instance of the application window is pinned down, and another instance of that application can be opened (for example from the Tools menu). If the pin tool is pinned up, then another instance of the application cannot be opened.
- If you click the pin tool in the Configuration pane in the Configuration Center, Diagnostic Center, Chassis View, and Statistics Report applications, that pane is pinned down, and an additional Configuration pane can be opened without overwriting the open pane.

2.2 What Basic Functions Can I Perform in Cisco MGM?

This section outlines basic functions that you can perform within Cisco MGM, including:

- 2.2.1 Launching Context-Sensitive Information
- 2.2.2 Filtering Data
- 2.2.3 Exporting Data
- 2.2.4 Exporting Alarms and Events
- 2.2.5 Refreshing Data
- 2.2.6 Pruning the Database

2.2.1 Launching Context-Sensitive Information

Many Cisco MGM views have a specific selection context, meaning that the same window will have a different look depending on where it was launched.

For example, if you launch the Alarm Browser from the management domain node, the browser shows all NE and EMS alarms (if you have permission to see EMS alarms). If you launch the Alarm Browser from a group or NE node, the browser shows only NE alarms. If you launch the Alarm Browser from the Dashboard, the browser shows all NE alarms for the Cisco MGM domain.

2.2.2 Filtering Data

Filter dialog boxes filter user-specified data. Many Cisco MGM tables have Filter dialog boxes that enable you to filter data in different ways and display the results in a table.

2.2.3 Exporting Data

Most Cisco MGM tables support an export function to export the table contents to a flat file. The Export dialog box allows you to export the data as comma-separated values (CSVs) or tab-separated values (TSVs), which are formats commonly used to import data into spreadsheet and database applications for further analysis and manipulation. Click the **Other** radio button if you want to separate the Cisco MGM data values with a different character. If you specify a character as a separator and your data contains the same character, the character in the data is automatically enclosed in double quotes. This allows the spreadsheet or database application to understand that the character is part of your data. Regardless of whether you select Comma-Separated, Tab-Separated, or Other, Cisco MGM automatically encloses text in double quotes if it has a separator.

Note If you export data to Microsoft Excel, save the exported file with ".csv" as the filename extension.

To export only the selected row(s), click the **Selected row(s)** radio button. To export all rows in the page, click the **All rows in current page** radio button.

By default, exported data is stored in the C:\Cisco\CiscoMGMClient<*version_number*>\exports or /opt/CiscoMGM<*version_number*>/exports directory under the name that you provide in the "Export data to file" text box. Click **Browse** to change the file location.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

2.2.4 Exporting Alarms and Events

In addition to exporting directly from the Alarm Browser or the Alarm Log, Cisco MGM provides an Event Export Manager that allows you to export alarms and events as they occur to the file of your choice. You can also set various export parameters to refine the export. You can choose to export events continuously or to export a specific number of events.

To export events continuously, in the Diagnostic Center, choose **Fault > Event Export Manager**, then click **Start Export**.

The Event Export Manager will export events continuously until you click **Stop Export**, or until the current Cisco MGM session ends, whichever occurs first.

To export a specific number of events, check the **Stop export when** check box, enter a number of records, and click **Start Export**. The export will stop after the specified number of events are logged.

Table 2-9 describes the fields in the Event Export window.

Table 2-9 Field Descriptions for the Event Export Manager

Field	Description
Network Elements	Allows you to export alarms (NE alarms and Cisco MGM-specific EMS alarms) and events for selected NEs. Choose from the list of available NEs and add them to the Selected list. If you have the appropriate user permission and you want to export EMS alarms and events, check the **Export MGM EMS Alarms/Events** check box.
Severity	Allows you to export events that have a severity of Critical, Major, Minor, Warning, Indeterminate, and/or Cleared.
Export To	Allows you to export the file to a given destination. Click **Browse** to browse for a particular destination. You can also overwrite or append the file.
Export Options	Allows you to specify the field separator type. Types include Comma, Tab, Semicolon, or Other, an option you use to specify a different separator. You can also check the **Stop export when** check box and enter a number of records to instruct the Event Export Manager to stop exporting after the user-specified number of records are logged.

2.2.5 Refreshing Data

Many Cisco MGM windows have a Refresh Data tool that refreshes all data being displayed by Cisco MGM. There are two versions of the Refresh Data tools, and both refresh data from either the server or the database.

- The Refresh Data tool flashes when updates are available. This tool has two modes: manual refresh and autorefresh.
- The Refresh Data tool does not notify you that updates are available. You must click the tool to retrieve updated data.

Note Clicking Refresh Data in the Domain Explorer window refreshes all data for the entire Cisco MGM client. Depending on the number of NEs in your network, you might experience a delay while the data refreshes.

2.2.6 Pruning the Database

Cisco MGM automatically prunes various categories of Cisco MGM data that tend to accumulate over time and would otherwise exhaust the available disk space. See 5.1.4 Pruning the Database. You can configure the following categories of data for automatic pruning:

- PM data
- FM data
- Audit log data
- Error log data
- Self-monitor data
- Job monitor data

The following options are provided to control the pruning for each category of data:

- Enable/disable
- Retention period
- Time of day to perform the pruning

2.3 What Are the General Features of Cisco MGM?

This section describes some of the general Cisco MGM features, including:

- 2.3.1 What is FCPS?
- 2.3.2 Understanding Fault Management
- 2.3.3 Understanding Configuration Management
- 2.3.4 Understanding Performance Management
- 2.3.5 Understanding Security Management
- 2.3.6 Using the Diagnostic Center
- 2.3.7 Managing Cisco MGM CORBA Interfaces

2.3.1 What is FCPS?

Cisco MGM's strategy is to provide a carrier-class fault, configuration, performance, and security (FCPS) EMS.

FCPS refers to the different types of information handled by management systems. A fifth area, accounting, is often included, making the acronym *FCAPS*. However, Cisco MGM does not support accounting management currently. Table 2-10 describes the FCPS functions.

Table 2-10 FCPS Framework Functionality

Function	Description	For More Information, See
Fault management	Detects, isolates, corrects, and reports faults for the network and service. Fault management tracks the correlation of related services; for example, reliability, availability, survivability, quality assurance, alarm surveillance, alarm management, fault localization, fault correction, testing, and trouble administration. Fault management in Cisco MGM can be performed in the Diagnostic Center or in the Configuration Center. The Alarm Browser, Alarm Log, and Dashboard also provide information on fault management.	Chapter 9, "Managing Faults"
Configuration management	Configures and controls NEs, identifies resources, collects information about a resource, and manages intra-chassis connections. Configuration management deals not only with the state of NEs, but also with the provisioning of resources and services. Generally, configuration management involves network planning, installation, service planning and negotiation, service provisioning, equipment provisioning, status and control, and network topology. The Configuration Center is your primary resource for configuration management.	Chapter 6, "Configuring Hardware"

Table 2-10 FCPS Framework Functionality (continued)

Function	Description	For More Information, See
Performance management	Gathers and reports the behavior of NEs, network, and services, including quality assurance, monitoring, management control, and analysis. Performance management can be performed in the Configuration Center or in the Statistics Report.	Chapter 10, "Managing Performance"
Security management	Prevents and detects any improper use of network resources and services as well as recovery from security violations. Aspects of security management include prevention, detection, containment, and recovery.	Chapter 8, "Managing Security"

2.3.2 Understanding Fault Management

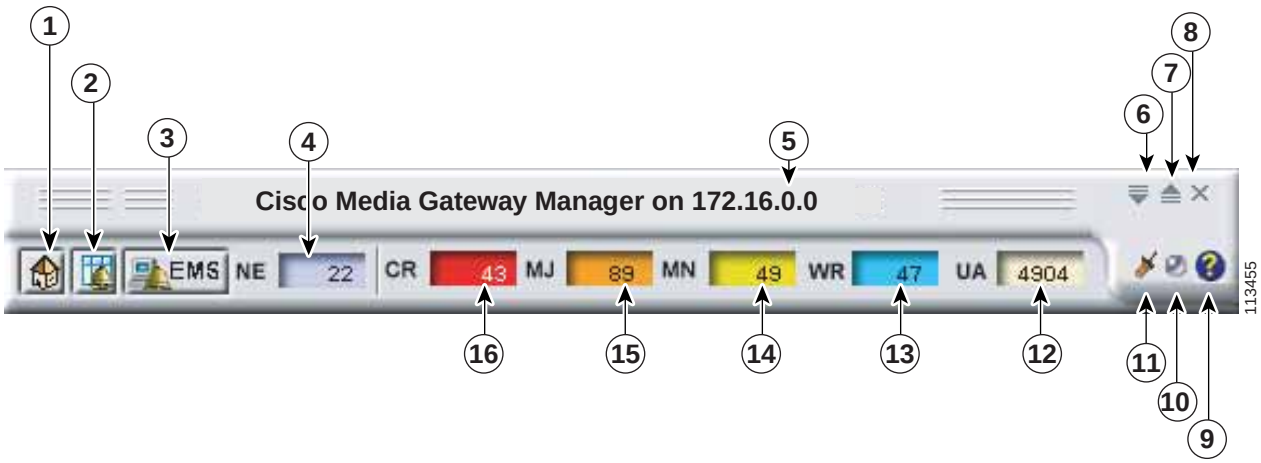
Fault management enables the network administrator to avoid catastrophic conditions through alarms and early warnings. The primary basis for fault management is provided by real-time messages (traps) generated by network elements when a change in status occurs.

The fault management tools for Cisco MGM are described in Table 2-11.

Table 2-11 Fault Management Tools

Name	Description
Alarm Management	Identifies network problems and failures by using alarm management. For more information, see Chapter 9, "Managing Faults."
Device Management with Chassis View	Provides a graphical view of equipment status for the operational and alarm status of each card, port, line, or trunk, which is represented with a predefined color. For more information, see 2.3.3.2 Managing Devices with Chassis View, page 2-18.
Diagnostic Center	Generates real-time displays of element performance and utilization using system counters repeatedly polled with SNMP, and facilitates the monitoring of activity and error rates of individual ports, lines, and trunks. By periodically polling each network element through SNMP, real-time counters detect and display hardware failures at the card, interface, port, line, and trunk level. Monitors statistics events to identify problems with Cisco MGM to effectively manage the network. For more information, see section 2.3.6 Using the Diagnostic Center, page 2-25.
Alarm Browser	Displays standing alarms and conditions in the managed domain. The Alarm Browser window lists the conditions that are assigned a severity level of critical, major, minor, or warning. It also shows cleared alarms that are not acknowledged. For more information, see Chapter 9, "Managing Faults."
Alarm Log	The Alarm Log window contains alarms that have transitioned from the Alarm Browser. Cleared alarms are transitioned when you acknowledge them or when automatic acknowledgment has been enabled (in the Control Panel > User Interface Properties pane). In addition, the Alarm Log shows a history of cleared and acknowledged alarms and all transient conditions (also known as events or autonomous nonalarmed messages). For more information, see Chapter 9, "Managing Faults."
Dashboard	The Cisco MGM Dashboard shows useful alarm and NE information in one easily accessible location. See Figure 2-1.

Figure 2-2 Dashboard



1	Layers the Domain Explorer window as the top active window. The Domain Explorer is the Cisco MGM home window[1].	**9**	Displays online help for the Dashboard.
2	Opens the Alarm Browser window; this highlights NE-specific critical, major, minor, and warning alarms.	**10**	Indicates a change in Cisco MGM status, including: • New alarms have occurred on NEs in the domain • New NEs have been added to the domain • Connectivity status has changed When a change in Cisco MGM status occurs, a blue outline appears around the affected EMS alarms icon, NE count box, or alarm count box(es). Click the Cisco MGM Status has Changed tool to acknowledge the status change. The tooltip toggles to No Change in Cisco MGM Status and the blue outline disappears, which indicates that you acknowledged the status change.
3	Opens the Alarm Browser window, filtered to show all EMS alarms in the domain. This tool is enabled only if you have read/write permission for the Show Cisco MGM EMS Alarms/Events operation.	**11**	If you click the pin tool, the Dashboard window is *pinned down*, meaning that it is not brought to the foreground by default. If you click the pin tool again, the Dashboard window is *pinned up*, meaning that it is brought to the foreground each time an update occurs (alarm counts change, NE count changes, and so on).
4	Lists the total number of NEs in the domain. Click the counter to open the Domain NE table, which provides an inventory of NEs within the selected management domain.	**12**	Lists the number of unacknowledged alarms in the domain. The alarm count includes unacknowledged alarms on NEs and on the EMS. Click the counter to open the Alarm Browser window, filtered to show all unacknowledged alarms.
5	Displays the server IP address.	**13**	Lists the number of warning alarms in the domain. The alarm count includes warning alarms on NEs and on the EMS. Click the counter to open the Alarm Browser window, filtered to show all warning alarms.

6	Minimizes all Cisco MGM windows, except for the Dashboard window itself.	**14**	Lists the number of minor alarms in the domain. The alarm count includes minor alarms on NEs and on the EMS. Click the counter to open the Alarm Browser window, filtered to show all minor alarms.
7	Restores all minimized Cisco MGM windows.	**15**	Lists the number of major alarms in the domain. The alarm count includes major alarms on NEs and on the EMS. Click the counter to open the Alarm Browser window, filtered to show all major alarms.
8	Closes the Dashboard.	**16**	Lists the number of critical alarms in the domain. The alarm count includes critical alarms on NEs and on the EMS. Click the counter to open the Alarm Browser window, filtered to show all critical alarms.

1. For a legend of Domain Explorer icons, see Appendix A, "Icons and Menus."

2.3.2.1 Defining Events and Alarms

Events and alarms are different with the following requirements:

- Events are network-generated entities that do not have any state or duration.
- Alarms are Cisco MGM generated entities that do have state and duration.
- Alarms and states are changed based on Cisco MGM receiving certain events.
- Only a subset of all events results in alarm state changes.

2.3.3 Understanding Configuration Management

Note For detailed information on configuration management, see Chapter 6, "Configuring Hardware."

Configuration management in Cisco MGM includes both the configuration of individual network elements at the port and line level, and the provisioning of user services, for example, network elements and connections.

These topics describe configuration management for Cisco MGM:

- 2.3.3.1 Configuration Center Overview, page 2-17
- 2.3.3.2 Managing Devices with Chassis View, page 2-18
- 2.3.3.3 Understanding Inventory Management, page 2-18
- 2.3.3.4 NE Release Management, page 2-19

2.3.3.1 Configuration Center Overview

The Configuration Center enables internal chassis connection configurations into one application.

The Configuration Center window has three main areas:

- Hierarchy Pane—Displays the network hierarchy as a tree of objects with real-time alarms. The tree is used to navigate the networks from the network level down to the port level.
- Configuration Pane—Displays the elements of the selected object. If an object is not selected, the configuration window is empty.

- Inspector View—Provides a list of detailed information for the selected network element from the hierarchy view. Click the **Show static data** button to update the information in the Inspector View.

2.3.3.1.1 Network Elements Overview

By performing network element configuration tasks, you can:

- Communicate with individual network elements, for example, a switch or a concentrator, using Simple Network Management Protocol (SNMP).
- Obtain a list of inventory data, for example, ports under a line or cards in a node.
- Create templates for all network elements.

2.3.3.1.2 Connections Overview

Configuration Center creates new connections, displays, modifies, and deletes existing connections. You select the desired connection end-points and configure the connection type and class of service. The end-to-end connection is automatically established between two cards in the switch. In addition, the status for each connection is viewed from one endpoint to the other.

By performing connection configuration tasks, you can:

- Provision SPVC connections for VISM, ATM and RPM.
- Configure the traffic parameters and other parameters for each end of the connection.
- Configure the connection parameters for the end-to-end connection.
- Add Descriptors to the connections.

2.3.3.2 Managing Devices with Chassis View

The front and rear panel displayed within the Chassis View provide a real-time indication of the status of individual cards, lines, and ports for the network device. Both card and line alarms (LEDs) are provided for all platforms and service modules.

By managing the graphical representations of the network nodes and device objects with Chassis View, you can:

- Provide status updates for nodes, cards, and lines.
- Display the front or rear view of the node.
- Perform provisioning tasks, such as, shelf, card, and line levels by quickly navigating to the Configuration Center.
- Display the LED status for each card reflecting both standby and active states.

2.3.3.3 Understanding Inventory Management

Inventory information is another component of configuration management. Cisco MGM provides two levels of inventory reports:

- Domain NE table—A complete list of all the NEs that belong to a specific group or to the entire domain.
- Equipment Inventory table—A detailed list of cards and modules installed on a specific NE. For detailed information about inventory reports, see Chapter 11, “Managing Inventory.”

2.3.3.3.1 Adding New NEs to the Cisco MGM Domain

The Add New NE wizard allows you to add a new NE, or to add several new NEs at once. The wizard allows you to enter multiple NE IP addresses one at a time, or enter a beginning and ending IP address and automatically add a range of NEs.

2.3.3.3.2 NE Connectivity and Operational States

The operational state of an NE can have the following values:

- Under Maintenance—The NE is temporarily under maintenance but requires monitoring. This state is the same as In Service except that Cisco MGM does not report alarms or events for under-maintenance NEs.
- In Service—The NE is currently deployed and requires monitoring. Cisco MGM collects polling, FM, configuration management, and PM data from in-service NEs and stores the data in the database.
- Out of Service—The NE has been marked Out of Service by a network administrator and does not require monitoring. The Cisco MGM database records the last known state of the NE when it was in service.
- In Service–Initializing—The NE is marked as In Service–Initializing when Cisco MGM connects to the NE (Communication State is marked as Available) and the discovery process starts. The initialization process is completed when fault and inventory have been synchronized. The operational state changes from In Service–Initializing to In Service–Synch Configuration.
- In Service–Sync Configuration—The NE is marked as In Service–Sync Configuration when Cisco MGM uploads a configuration for that NE. You can change the operational state of an NE from In Service–Sync Configuration to Out of Service.

The communication state of an NE can have the following values:

- Not Applicable—The NE is Out of Service. The connection to the NE has not been established or has been dropped.
- Available—The NE is In Service or Under Maintenance and Cisco MGM is connected to the NE. The NE is declared Available when the NE is reachable and supported by Cisco MGM (as defined in the Administration > Supported NE table).
- Unavailable—The NE is In Service or Under Maintenance but Cisco MGM cannot establish a connection to the NE. When Cisco MGM loses the connection to the NE, an EMS alarm with a probable cause of “Connection loss” is generated.

2.3.3.4 NE Release Management

An NE added to the Cisco MGM domain is discovered and managed by Cisco MGM only if the NE software version is defined in the Supported NE table.

Note See *Cisco Media Gateway Manager 5.0 Release Notes* for the NE software versions that are supported in Cisco MGM 5.0. The Cisco MGM release notes are available on the product CD and online at http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/optnet/mgm/mgmreln/index.htm.

Caution Before updating the software image on an NE, check the Cisco MGM release notes to verify whether the NE software version is supported in this Cisco MGM release.

The following NE administration features are available for the Cisco MGX 8880 and Cisco MGX 8850:

- Software download
- Memory backup and restore
- Job monitoring
- NE Software table (used to commit or revert software images)

2.3.3.4.1 Software Download Dialog Box

Use the Software Download dialog box to download software to NEs. After the download is complete you can use the NE Software table to activate the software. The downloaded software becomes the active version, and the active version becomes the standby version. Cisco MGM stores two software versions, active and standby.

2.3.3.4.2 Memory Backup Dialog Box

Use the Memory Backup dialog box to back up configuration and provisioning information that resides in the flash memory of an NE. By default, the local Cisco MGM server automatically backs up the memory of NEs once a day for seven days and stores the backup files on the Cisco MGM server. After seven days, the oldest backup file is replaced by the current backup.

2.3.3.4.3 Memory Restore Dialog Box

Use the Memory Restore dialog box to restore provisioning and configuration information stored in the flash memory of an NE.

2.3.3.4.4 Job Monitor Table

The Job Monitor table provides information about scheduled administrative tasks such as task type, task owner, task status, task start and end time, and so on.

2.3.3.4.5 NE Software Table

The NE Software table displays the active and standby software versions for the NE. From this table, you can activate new software or revert software on NEs.

2.3.4 Understanding Performance Management

The performance management function in Cisco MGM involves the system's ability to collect and store massive amounts of statistical data for network activity.

Note For detailed information on performance management and the Statistics Report, see Chapter 10, "Managing Performance."

2.3.4.1 Statistics Report

You can use the Statistics Report to view reports of statistics data that are collected from the switch.

You can launch the Statistics Report from various Cisco MGM applications, such as the Diagnostic Center, Configuration Center, or Chassis View. The Statistics Report appears in the toolbar.

To launch Statistics Report, choose **Performance > MGX 8880/8850MG > Statistics Report**.

Depending upon the report selected, you can identify certain criteria, such as network object, type of statistics, granularity, report interval, and graphical format.

Note VISM cards are supported for the Statistics Report.

Table 2-12 lists the report types that are supported for each network element from the Hierarchical Tree.

Table 2-12 Report Types for Each Network Element

Network Element	Report Types
Network	Supports the following report types: • Raw Data Report for cards, lines, ports, and trunks in the network. • Utilization Data Report for ports and trunks in the network.
Node	Supports the following report types: • Raw Data Report for all cards, lines, ports, PNNI, trunks, and paths on the node. • Utilization Data Report for ports and trunks on the node.
Card	Supports the following report types: • Raw Data Report for all cards[1], lines, ports, PNNI, trunks, and paths on the card. • Utilization Data Report for connections, ports, and trunks on the card.
Port	Supports the following report types: • Raw Data Report for ports and connections on the selected port. • Performance Data Report for ports and connections on the selected port. • Utilization Data Report for ports and connections on the selected port.
Line	Supports the following report types: • Raw Data Report for the line. If applicable, additional statistics are shown for physical lines.
Paths	Supports the Raw Data Report for paths and other elements.

1. Card support is used only for AXSM cards.

2.3.5 Understanding Security Management

Security management protects the revenue-generating assets in the network. Examples of security management include:

- Controlling access to element management functions
- Controlling access to network logical resources

Security for the Cisco MGM system can be divided into the following areas:

- Cisco MGM security domain: To log into the Cisco MGM client, a username and password are required. A user profile defines the access privileges. Cisco MGM passwords are stored using MD5 one-way encryption.

- OSS security domain: OSS-to-Cisco MGM sessions are configured by the Cisco MGM GateWay EMS-to-NMS interface architectural component.
- NE security domain: At the NE level, a username and password are configured to enable the user to connect directly through the console port (EIA/TIA-232), through the management port (10BASE-T), or remotely through an SSH or Telnet session. NE passwords are stored using base-64 two-way encryption.
- Cisco MGM server login: You must have root user privileges to log into the Cisco MGM server workstation for debugging or changing the Cisco MGM server program. A username and password are required.
- Oracle database access: Access to the Oracle database requires Oracle root user authentication, as well as Cisco MGM database access authentication. The Oracle username and password are encrypted in the server configuration file.

Cisco MGM supports the following security features:

- 2.3.5.1 Logging into the Client, page 2-22
- 2.3.5.2 Login Advisory Message, page 2-22
- 2.3.5.4 User Management and Profiles, page 2-23
- 2.3.5.5 NE Access Control, page 2-24
- 2.3.5.6 Audit Log, page 2-24

2.3.5.1 Logging into the Client

See *Cisco Media Gateway Manager 5.0 Installation Guide* for the procedure to log into the Cisco MGM client on a Windows or Solaris workstation.

2.3.5.1.1 Locking and Unlocking the Client

A Cisco MGM client is locked automatically after a defined period of inactivity.

- To manually lock the Cisco MGM client, select **File > Lock Cisco MGM Client** in the Domain Explorer. The Cisco MGM Locked window opens, indicating that the Cisco MGM client is locked.
- To unlock the Cisco MGM client, enter your password in the MGM Locked window; then, click **Unlock**.

2.3.5.2 Login Advisory Message

The following is the default advisory message after logging into the Cisco MGM client:

```
NOTICE: This is a private computer system. Unauthorized access or use may lead to
prosecution.
```

You can customize the default advisory message, or disable it altogether. For more details, see Chapter 8, “Managing Security.”

2.3.5.3 Understanding Network Partitioning

You can configure for network partitioning by dividing the network into logical areas. You can then access only the areas that are specified under your security profile. The nodes and elements must fall under the area or areas that fit your security profile for each Cisco MGM application.

You can:

- Define the network partitions from the associated list of nodes.
- Define, modify, and view the areas within your network.
- Manage only the areas under your security profile.
- Manage connections that originate and terminate within the assigned area(s). The domain can include multiple areas.

2.3.5.4 User Management and Profiles

Cisco MGM user management includes the ability to:

- Manage predefined default user profiles with different access privileges, also known as network partitioning, which allows you to define user types and levels of access to the network. The default user types are:
  - SuperUser—Users who have access to all operations associated with the Cisco MGM server and client.
  - SysAdmin—System administrators who manage Cisco MGM access. They can perform limited tasks associated with the Cisco MGM server and client. This privilege is primarily used as the main profile when Cisco MGM has been initially installed.
  - NetworkAdmin—Typically, network operations center (NOC) supervisors who perform daily network surveillance, provisioning, and PM activities on any group or NE.
  - Provisioner—Users who perform daily network surveillance, provisioning, and PM activities on specific NEs. Each Provisioner can have only one active session. Provisioners cannot access administrative information.
  - Operator—Users who perform daily network surveillance and PM activities on specific NEs. Each Operator can have only one active session. Operators cannot access administrative information.
- Create, delete, modify, and duplicate custom user profiles with certain privileges. Custom user profiles are grouped into categories and each category has a set of operations.
- Create, delete, or modify Cisco MGM users; lock or unlock user accounts; view logged-in users; and end active user sessions.
- Regulate user logins, including password aging, number of failed login attempts before an account lockout, login disable period, lockout time, and logout time.
- Configure the username and password used by the Cisco MGM server and Cisco MGM GateWay/CORBA to access NEs.
- View, add, modify, and delete NE user accounts on one or more NEs.

Note For detailed information about user management, see Chapter 8, “Managing Security.”

2.3.5.4.1 Configuring Cisco MGM User Access

You can configure user access by using the Administration menu, which provides controlled access (network partitioning) to multiple users of Cisco MGM, based on the user’s UNIX user-ID and password. The Administration menu is launched from the Domain Explorer window.

By configuring user access, you can:

- Provide user-access profiles that can be customized for each user. The user-access profile is a list of operations or actions a user can perform coupled with assigned access privileges for each action.
- Assign access privileges to read, create (write), modify, and delete profiles.

  By default, only the *root* user can start and stop the Cisco MGM core processes. The *root* user has sufficient access privileges to launch all Cisco MGM applications and administer security.

Other users are assigned access privileges that enable them to perform operations within security-controlled applications. Depending on the setting of access privileges by those who administer security management, the operations are limited. Without the proper access privileges, users cannot launch security-controlled applications.

Note For detailed information about user access, see Chapter 8, "Managing Security."

2.3.5.5 NE Access Control

NE access control includes the ability to:

- Configure the username and password used by the Cisco MGM server and Cisco MGM GateWay/CORBA to access NEs and retrieve alarms, configuration, and inventory information.

  Note Each username and password specified must exist on the selected NE in order for Cisco MGM to manage it. A new or modified password takes effect at the next reconnection.

- Configure the username and password on multiple NEs by using the bulk NE authentication feature. With a single operation, you can specify the same username and password for NEs that belong to the same group or are assigned to the same user.
- Manage NE user accounts by using the NE User Access Administration table. This feature supports the ability to view, add, modify, and delete NE user accounts on one or more NEs.
- Monitor active NE users and log out selected users.
- Add predefined users on a selected NE.

2.3.5.6 Audit Log

The Audit Log contains information about significant events (user-initiated changes and activities) that occurred on the Cisco MGM server during a specific time period for the purposes of establishing accountability. It also helps in identifying remedial actions to correct an improper activity. The Audit Log is implemented in the Cisco MGM database, where each record has a time stamp, record type, and message string.

Tip See Chapter 8, "Managing Security" for a list of runtime-affecting operations that the Audit Log records for monitoring purposes.

2.3.6 Using the Diagnostic Center

Note For detailed information about using the Diagnostic Center, see Chapter 9, "Managing Faults."

You can launch the Diagnostic Center from various Cisco MGM applications, such as the Statistics Report, Configuration Center, or Chassis View. The Diagnostic Center tool appears in the toolbar.

To launch the Diagnostic Center, you can:

- Choose **Fault > MGX 8880/8850MG > Diagnostic Center**.

The Diagnostic Center consolidates all the following diagnostic operations:

- 2.3.6.1 Diagnostic Operations for Network Elements, page 2-25
- 2.3.6.2 Diagnostic Operations for Network Manageability, page 2-25
- 2.3.6.3 Diagnostic Operations for Connections, page 2-25

2.3.6.1 Diagnostic Operations for Network Elements

You can diagnose network elements, for example, networks, nodes, cards, lines, ports, paths, or trunks.

By diagnosing network elements, you can:

- Monitor real-time counters.
- Extend support for the Node Resync process to allow for two different levels.
- Configure bit error rate test (BERT) to verify the integrity of a network element by measuring error statistics.

2.3.6.2 Diagnostic Operations for Network Manageability

You can monitor statistic events for network manageability to collect element management health-related statistics. In addition, you can:

- Verify that all the nodes in the network are managed correctly by Cisco MGM.
- Identify general network problems.
- Provide success rates, failure rates, and throughput of Cisco MGM to protocols such as FTP and SNMP.
- Create a trouble ticket that extracts all the information from the History Panel.

2.3.6.3 Diagnostic Operations for Connections

By diagnosing connections, you can:

- Access fault management capabilities in the form of diagnostic tests for connections, which include continuity (integrity) facility for PNNI soft permanent virtual connection (SPVC).
- Perform general test operations such as up and down connections, and connection loopback.

2.3.7 Managing Cisco MGM CORBA Interfaces

Chapter 12, "Managing CORBA Interfaces." describes the management of Cisco MGM GateWay/CORBA, which allows another program or application to communicate with the Cisco MGM server, and also about CORBA management, which allows communication between the Cisco MGM client and server.

Planning the Network

This chapter describes the basics of planning a network and identifies some of the resources available to the network planner using Cisco MGM:

- 3.1 Network Planning
- 3.2 What Network Elements Are Available to a Network Planner?

3.1 Network Planning

Network planning is the process of deciding the topology and capacity of a network. Network planning can achieve the business return on investment (ROI) by enabling high-performance networks and communications applications.

It is important to take the time to review and plan your network before you build and configure it. During network planning, remember to keep future needs in mind as well as present requirements, so that the topology and capacity of the networks can be changed, if required.

Adequate network planning is needed for a number of reasons, including to:

- Satisfy key business drivers such as low operating costs or rapid return on investment
- Respond to network growth and traffic distribution changes in the future
- Identify and satisfy the needs of customers
- Anticipate and provide protection in the event of a catastrophe
- Centralize management, resulting in lower administration costs
- Support many and varied company requirements quickly and efficiently
- Identify hardware requirements

The key stages are planning, analyzing, and reviewing a network. Network planning may be required for a new network, or you may be analyzing an existing network before upgrading the existing infrastructure.

3.2 What Network Elements Are Available to a Network Planner?

The following sections detail the switches and cards that are available:

- 3.2.1 Cisco MGX 8880 Media Gateway

- 3.2.2 Cisco MGX 8850 Multiservice Switch
- 3.2.3 Cisco PXM-45 Processor Switch Module
- 3.2.4 Cisco Voice Switch Service Module
- 3.2.5 Cisco Voice Interworking Service Module
- 3.2.6 Cisco Route Processor Module
- 3.2.7 Cisco AXSM Broadband ATM Switch Module
- 3.2.8 Cisco MGX Service Resource Module

3.2.1 Cisco MGX 8880 Media Gateway

The Cisco MGX 8880 Media Gateway hardware has the same slot configuration as the Cisco MGX 8850 Multiservice Switch, but with a smaller chassis. The Cisco MGX 8880 fits in a 19-inch or a 23-inch rack. It is optimized for voice applications, and supports two types of voice service modules; Cisco Voice Switch Service Module (VXSM) and Cisco Voice Interworking Service Module (VISM). It also features the following:

- The DC version of the Cisco MGX 8880, with its low profile cooling system, enables three gateways to fit in a 7-foot rack.
- The MGX 8880 uses the PXM-45/C controller card only.
- The MGX 8880 uses an integrated redundancy connector (RCON).

3.2.2 Cisco MGX 8850 Multiservice Switch

The Cisco MGX 8850 Multiservice Switch is designed for service providers deploying narrowband and/or broadband services. It can be voice enabled with VXSM and VISM modules. The Cisco MGX 8850 scales from DS0 to OC-48c/STM-16 and supports any combination of the following services:

- Frame Relay
- ATM
- Voice over ATM
- Voice over IP
- Circuit emulation
- IP
- Wireless aggregation
- DSL aggregation
- ATM service backbones

3.2.3 Cisco PXM-45 Processor Switch Module

The Cisco PXM-45 Processor Switch Module for the Cisco MGX 8880 and Cisco MGX 8850 IP + ATM Multiservice Switch is a combination ATM switching fabric and processor card. The switching fabric provides 45 Gbps of nonblocking switching capacity, while the processor provides the control plane that delivers IP+ATM networking software, diagnostics, and performance monitoring.

The Cisco PXM-45 provides the following features:

- 45-Gbps nonblocking switching
- Hot card insertion/removal
- 1:1 hot-standby redundancy
- User-selectable primary and secondary clock sources with graceful switchover
- Internal Stratum-3, external building integrated timing supply (BITS), or inband clock sources
- Inband or out-of-band management via EIA/TIA-232 or 10BaseT control ports
- Support for narrowband and broadband service modules scaling from DS0 to OC-48c/STM-16

3.2.4 Cisco Voice Switch Service Module

The Cisco Voice Switch Service Module (VXSM) is a high-density voice module that enables compatibility with the Cisco MGX 8880 Media Gateway and the Cisco MGX 8850 Multiservice Switch. The Cisco VXSM provides high availability, scalable, and robust voice features for wireless, wireline, and cable applications.

The Cisco VXSM has time-division multiplexing (TDM) interfaces ranging from T1/E1 to channelized OC-3/STM-1. It provides service providers with carrier-class capabilities for high capacity and reliability for Voice over IP (VoIP) services. The Cisco VXSM supports up to 8064 DS-0s and can protect active voice calls if scheduled or unscheduled outages occur.

The Cisco VXSM architecture combines a high-performance voice services engine with onboard digital signal processors (DSPs) to provide advanced voice processing and features that allow quick development and deployment of VoIP services. The Cisco VXSM offers carrier-grade voice quality with voice, modem, and fax features. Together with a softswitch, it provides deployment flexibility for various packet voice networks based on the MGCP, PacketCable Trunking Gateway Control Protocol (TGCP), H.248, H.323, and the session initiation protocol (SIP). Cisco VXSM architecture allows new functions and services to be easily added through software upgrades.

- The VXSM provides the following high density features:
  - Scales up to 8064 VoIP DS-0s per service module
  - Reduces costs by maximizing density per platform
  - Allows 40,320 VoIP DS-0s per chassis and 120,960 VoIP DS-0s per rack, with echo cancellation
- TDM interfaces provide:
  - Scalable optical interfaces; available with 2- or 4-port OC-3/STM-1 interfaces per service module
  - Scalable electrical interfaces; up to 48 T1/E1 interfaces per service module
- VXSM high availability—Ensures carrier-class reliability by providing active call preservation
- VXSM integrated nonblocking architecture—Lowers costs by integrating TDM, network processing, and DSP technology onto a single module

3.2.5 Cisco Voice Interworking Service Module

The Cisco Voice Interworking Service Module (VISM-PR) is a packet voice module for the Cisco MGX 8880 Media Gateway and the Cisco MGX 8000 Series multiservice switches. The Cisco VISM-PR offers robust packet voice functions for service providers and enterprise customers, and supports full 8 T-1s/E-1s capacity for G.711, G.726 and G.729ab codecs.

The VISM-PR provides high quality voice, fax, and modem services. The VISM-PR can be deployed in standalone configurations or with softswitches to enable a variety of packet voice services in network architectures using MGCP, PacketCable TGCP, H.323, and SIP.

The VISM-PR allows you to easily add packet voice services to existing Cisco MGX 8000 Series multiservice networks.

The VISM-PR provides the following features:

- High density voice aggregation:
  - Up to 20 VISM-PR per MGX 8880 MG chassis
  - 1: N redundancy
  - Channelized T3/OC-3/STM-1 via SRME Module
- Distributed card architecture:
  - Dedicated high-performance DSP resources
  - Dual control processors to eliminate processing bottlenecks
  - No loss of DS0 Density under any configuration (ECAN, codec)
- Dynamic DSP allocation:
  - G.711, G.726, G.729ab, G.723.1, T.38 Fax, clear channel
  - VAD and comfort noise generation
  - Programmable 24, 32, 64, 128 ms echo cancellation
  - DTMF / MF detection / generation

3.2.6 Cisco Route Processor Module

The Cisco Route Processor Module-Premium (RPM-PR) is a high-performance route processor module for the Cisco MGX 8000 Series of multiservice switches, which allows service providers to quickly enable new, high-margin IP services using Cisco IOS Software. The Cisco RPM-PR provides high-quality, scalable, IP and ATM integration using Multiprotocol Label Switching (MPLS) technology to create scalable Internet solutions. The Cisco RPM-PR allows the addition of an MPLS control plane for use by the Cisco Virtual Switch Architecture. The MPLS control plane can be used concurrently with the PNNI and Media Gateway Control Protocol (MGCP) control planes on the Cisco MGX 8000 series of multiservice switches.

The Cisco RPM-PR brings enhanced performance and functionality to the RPM module's router blades for the Cisco MGX 8880 and Cisco MGX 8850. Improvements include a high-performance, NPE-400 processor capable of processing more than 350,000 packets per second (pps), greater DRAM and Flash capacity, and hardware-based error checking and correction (ECC).

The Cisco RPM-PR enables functionality such as Point-to-Point Protocol (PPP) aggregation, IP VPNs, IP QoS, and IP routing.

The Cisco RPM-PR is a double-height line card, which connects to the MGX midplane through an internal OC-6 ATM cell bus. The Cisco RPM-PR supports up to two single-height back cards: four-port Ethernet and one-port Fast Ethernet.

The RPM-PR provides the following features:

- High performance
  - Over 350,000 pps forwarding
  - Up to 512 MB DRAM
  - 32 MB Flash memory
  - Support for 2000 virtual interfaces
  - Single bit repair and double/triple bit detection ECC support for DRAM
  - 1:N redundancy
- Robust IP support
  - Border Gateway Protocol Version 4 (BGP4)
  - Open Shortest Path First (OSPF) Protocol
  - Routing Information Protocol (RIP) Versions 1 and 2
  - Interior Gateway Routing Protocol (IGRP)
  - Enhanced IGRP (EIGRP)
  - Intermediate System-to-Intermediate System (IS-IS)
  - Static routes

3.2.7 Cisco AXSM Broadband ATM Switch Module

The Cisco AXSM Broadband ATM Switch Module in combination with the high-capacity PXM-45 processor and XM-60 switching module delivers connectivity from T3/E3 to OC-48c/STM-16. The Cisco MGX 8880 and Cisco MGX 8850 Multiservice Switch can accommodate a total of 12 AXSM modules to provide the high broadband densities required by service providers.

The AXSM architecture, combined with PXM-45 and RPM, provides ATM networking features such as such as Private Network-Network Interface (PNNI), switched virtual circuit/path (SVC/SVP), soft permanent virtual circuit/path (SPVC/SPVP), and MPLS.

The AXSM module gives carrier-class availability by providing hot-standby 1:1 card redundancy with Y-cable as well as redundancy with SONET/SDH automatic protection switching (APS). The AXSM module with its large connection count is highly scalable for aggregation applications.

The AXSM Broadband ATM Switching Module provides the following features:

- ATM capability up to OC-48c/STM-16.
- High scalability in interface speeds with T3/E3 ports, OC-3c/STM-1, OC-12c/STM-4, and OC-48c/ STM-16 AXSM modules. Each port on the AXSM can be configured for either trunk or access applications.
- Module port densities of 16 T3/E3 ports, 16 OC-3c/STM-1 ports, 4 OC-12c/STM-4 ports, and 1 OC-48c/ STM-16 port that can scale up to 12 OC-48c/STM-16 modules in each Cisco MGX 8880 and Cisco MGX 8850 Multiservice Switch. Each OC-48c/STM-16 provides nonblocking, full duplex throughput, in which a connection can occupy the entire line rate.

- Support for all ATM service classes, with up to 16 classes of service (CoS). Supports carrier-class implementation of standards-based PNNI, SVC/SVP, SPVC/SPVP, and MPLS services.
- Large cell buffers (one million cells), which help to maximize performance during congestion, reducing the number of retransmits; the buffers are allocated dynamically, depending on connection resource needs, thereby optimizing use of system resources.
- High reliability with hot-standby 1:1 AXSM card redundancy, and 1:1 and 1+1 line redundancy using APS.

3.2.8 Cisco MGX Service Resource Module

The Cisco MGX Service Resource Module (SRM) provides three major functions for service modules:

- Bulk distribution of T1 and E1 traffic
- Bit error rate testing of T1 and E1 lines and ports
- 1:N redundancy

The Cisco MGX-SRM operates at line speeds of OC-3 rather than DS3. The Cisco MGX SRM provides the existing functionality of the SRM-3T3, such as bulk distribution, 1:N redundancy, and bit error rate tester (BERT). It supports one SONET or Synchronous Digital Hierarchy (SDH) interface using SMFIR-155 (optical) and SMB-155 (electrical) back cards.

The Cisco MGX SRM architecture is similar to that of the current SRM-3T3/C, with the following additional features:

- Bulk distribution of T1 or E1 traffic to all 12 service module slots using one SONET or SDH OC3/STM1 interface
- 1:1 SRM Hot-Standby Router Protocol (HSRP) redundancy
- Card-to-card linear (1+1) APS support for optical interfaces
- No back card requirement for SRM operation when bulk distribution is not required

Building the Network

Once you have planned your network (see Chapter 3, “Planning the Network”), you can begin building network elements and their related aspects, such as groups, network partitions, and Network Maps.

This chapter contains the following sections:

- 4.1 What Network Elements Are Available?
- 4.2 How Do I Add and Delete Network Elements?
- 4.3 How Do I Build Groups?
- 4.4 How Do I Configure the SNMP Community String?
- 4.5 How Do I Build Network Maps?
- 4.6 How Do I Discover the Network?
- 4.7 How Do I Synchronize the Network?
- 4.8 How Do I Test Connectivity?

4.1 What Network Elements Are Available?

The Cisco MGM management domain contains and lists network elements (NEs) and groups of NEs. The management domain can be found as the top-level root node in the topology tree of the Domain Explorer. In the management domain, you can add, delete, and modify the following NE:

- Groups—Collection of groups or collection of NEs. NEs are often grouped geographically or by domain.
- Network partitions—Groups of users who have access to groups of NEs.
- Network Maps—Geographic representation of the NEs which displays the NEs in a map, and the number of alarms associated with the NE.

4.2 How Do I Add and Delete Network Elements?

This section contains the following information:

- 4.2.1 Prerequisites for Adding Network Elements
- 4.2.2 Enabling Performance Monitoring
- 4.2.3 Adding Network Elements

- 4.2.4 Network Element Discovery
- 4.2.5 Copying a Network Element from One Group to Another
- 4.2.6 Moving a Network Element from One Group to Another
- 4.2.7 Deleting Network Elements
- 4.2.8 Restoring a Deleted Network Element

4.2.1 Prerequisites for Adding Network Elements

You must enable the NE service before you can add an NE. You must also meet certain other specific prerequisites depending on the type of NE you are adding. The following aspects must be configured before adding NEs:

- Hostnames and IP addresses
- SNMP community strings
- Topology setup
- Performance monitoring (optional)

4.2.1.1 Enabling the NE Service

Before adding a new NE, you must enable the NE service for that NE.

The NE Service is enabled by default. However, if you need to enable the NE service:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**. The Control Panel appears.

Step 2 In the tree view of the Control Panel, expand **NE Service**.

Step 3 Select an NE type.

Step 4 In the property sheet of the Control Panel, click **Activate** in the Service Control field.

Note The service is not started as a process unless you activate an NE for that particular service.

4.2.1.2 Hostnames and IP Addresses

All NEs must be configured with unique hostnames and IP addresses.

4.2.2 Enabling Performance Monitoring

Performance monitoring is optional, but you must enable it if you want to collect performance parameters:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**. The Control Panel appears.

Step 2 In the tree view of the Control Panel, expand **PM Service**.

Step 3 Select an NE type.

Step 4 In the property sheet of the Control Panel, click **Activate** in the Service Status field.

Step 5 In Error Level, choose the error level for alarms on the selected NE to include in the Error Log (Critical, Major, Minor, Informational, Debug, or Trace). Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file.

Caution Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer.

Threshold displays the number of NEs that will be serviced by one instance of the NE service.

Note The service is not started as a process unless you activate an NE for that particular service.

4.2.3 Adding Network Elements

From the Domain Explorer, you can add a single or multiple NEs using the Add Network Element(s) wizard:

- 4.2.3.1 Adding a Single Network Element
- 4.2.3.2 Adding Multiple Network Elements

4.2.3.1 Adding a Single Network Element

From the Domain Explorer, you can add a single NE:

Step 1 Select a node in the Domain Explorer; then, choose **File > Add Network Element(s)**. You can also click the **Add Network Element(s)** tool. The Add Network Element(s) wizard appears. See Figure 4-1.

Note You cannot add a new NE to the Discovered Network Elements or Deleted Network Elements group.

Step 2 Enter the following information (see Table 4-1 for more details):

a. NE Model
b. NE Type
c. NE Addition—Click the **Single NE Addition** radio button
d. IP address

Step 3 Click **Next**.

Note If you click **Finish** in this window, default values will be assigned to the remaining fields.

Step 4 Enter the following information:

a. NE ID

Note Do not use “MGM” as an NE ID because the Alarm Browser might contain Cisco MGM alarms with the source ID “MGM.” It will be difficult to distinguish between NE alarms and Cisco MGM alarms if they both have the same source ID (“MGM”). For the same reason, do not cause Cisco MGM to automatically populate an NE whose NE ID is “MGM.”

If the NE ID field is left blank, it will default to the IP address. After communication is established, Cisco MGM discovers the NE ID from the NE.

b. Operational state

c. SNMP Community String

d. SNMP Community String (Set)

e. NE Service Level User Name

f. NE Service Level Pass Word

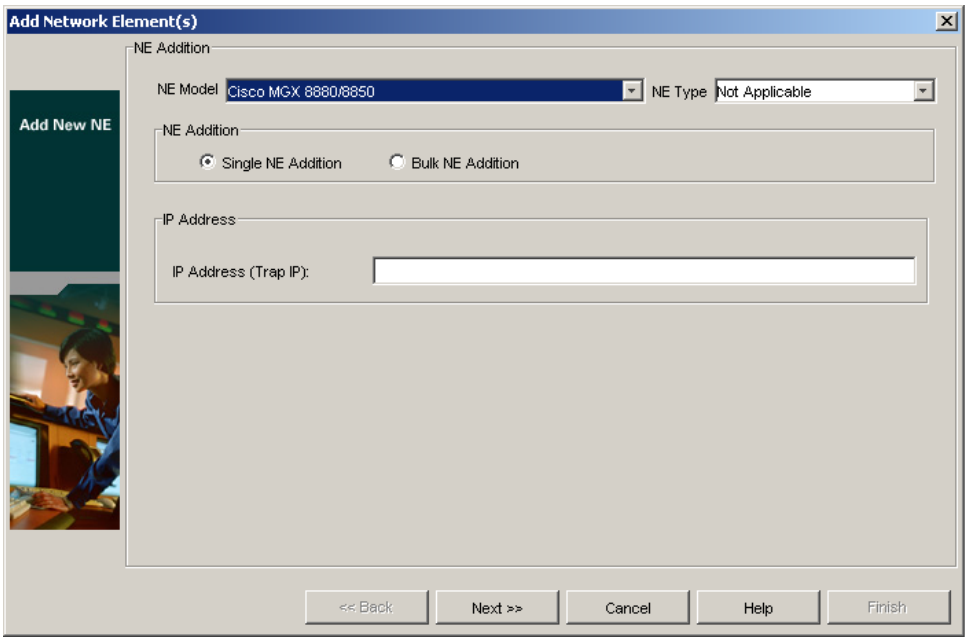
g. Description

Step 5 Click **Finish** to add the new NE to the Domain Explorer tree.

Step 6 Wait two to five minutes while the Cisco MGM server completes the node discovery.

Step 7 Check to see if the communication state is correct. If Cisco MGM cannot connect to the NE, the NE displays an unavailable communication state icon in the Domain Explorer tree.

Figure 4-1 Add Network Elements Window



4.2.3.2 Adding Multiple Network Elements

From the Domain Explorer, you can add multiple NEs

Step 1 Select a node in the Domain Explorer; then, choose **File > Add Network Element(s)**. You can also click the **Add Network Element(s)** tool. The Add Network Element(s) wizard appears. See Figure 4-1.

Note You cannot add a new NE to the Discovered Network Elements or Deleted Network Elements group.

Step 2 Enter the following information (see Table 4-1 for more details):

a. NE Model
b. NE Type
c. NE Addition—(not available with Not Managed/Other Vendor NEs)—Click the **Bulk NE Addition** radio button
d. IP Address Range—Enter the IP addresses in the **From** and **To** fields of the NE and click **Add**
e. IP Address Selection—Add or remove IP addresses using the **Add** and **Remove** buttons.

Step 3 Click **Next**.

Note If you click **Finish** in this window, default values will be assigned to the remaining fields.

Step 4 Enter the following information:

a. NE ID—*Display only.*
b. Operational state
c. SNMP community string
d. NE Service Level User Name
e. NE Service Level Pass Word
f. Description

Step 5 Click **Finish**.

Step 6 Select the grouping option for the NEs.

Step 7 Click **Finish** to add the NEs to the Domain Explorer tree.

Wait two to five minutes while the Cisco MGM server completes the node discovery.

Table 4-1 Field Descriptions for the Add Network Element(s) Wizard

Screen	Field	Description
NE Addition	NE Model	Allows you to select the NE model (Cisco MGX 8880/Cisco MGX 8850).
	NE Type	The NE Type is not available.
	NE Addition	Select Single NE Addition to add only one NE. Select Bulk NE Addition to add several NEs simultaneously. The available fields will change, depending on which item you select.
	IP Address (for single NE additions)	Allows you to enter a unique IP address for the NE. It must be in the form *ddd.ddd.ddd.ddd*, where *ddd* is a decimal octet expressed as an integer between 0 and 255. The first octet cannot be a zero. **Note** Prior to the NE ID discovery, Cisco MGM uses the NE IP address as a temporary NE ID. **Note** The IP address field is unavailable when adding Not Managed/Other Vendor NEs.
	From IP Address (for bulk NE additions)	Enter the beginning IP address for the range of NEs you want to add.
	To IP Address (for bulk NE additions)	Enter the ending IP address for the range of NEs you want to add. Click **Add** to add the range to the Select IP field.
	IP Address Selection	Select one or more IPs in the Deleted IP field and click **Add** to add them to the Selected IP field. Select one or more IPs in the Selected IP field and click **Remove** to remove them from the Selected IP field. Only the IPs in the Selected IP fields are affected by clicking **Next**.

Table 4-1 Field Descriptions for the Add Network Element(s) Wizard (continued)

Screen	Field	Description
NE Properties	NE ID	Allows you to enter a unique name for the NE in the form of an ASCII text string. Apostrophes (') and quotation marks (“) are not accepted. The NE ID you enter should be the same as the NE ID that is configured on the NE itself. If it is not the same, this field will be updated with the NE hostname. **Note** Do not use “MGM” as an NE ID because the Alarm Browser might contain Cisco MGM alarms with the source ID “MGM.” It will be difficult to distinguish between NE alarms and Cisco MGM alarms if they both have the same source ID (“MGM”). For the same reason, do not cause Cisco MGM to automatically populate an NE whose NE ID is “MGM.” **Note** If the NE ID field is left blank, it will default to the IP address. After communication is established, Cisco MGM discovers the NE ID from the NE.
	Operational State	Allows you to specify the operational state of the NE. There are three states: • Under Maintenance—The NE is temporarily under maintenance but requires monitoring. • In Service—The NE is currently deployed and requires monitoring. • Out of Service—The NE has been marked Out of Service and does not require monitoring.
	SNMP Community String	Allows you to enter the SNMP community string for the NE. By default, the SNMP get community string is **public** and SNMP set community string is **private**.
	NE Service Level User Name	Allows you to enter the user name. The default is cisco.
	NE Service Level Pass Word	Allows you to enter the password. The default is cisco.
	Description	Allows you to enter a description of the NE.

Note Errors encountered while adding NEs are listed in the Error Log.

4.2.4 Network Element Discovery

The Cisco MGM discovery service collects information from individual NEs; discovers new NEs; updates network-level information (such as physical topology); and updates device-level information (such as inventory and alarms).

Note The Discovered Network Elements group can only be viewed by SuperUsers and NetworkAdmins in cases where all NEs are assigned to them.

The discovery process starts when a new NE is added to Cisco MGM. When discovery completes, all information associated with the NE (such as inventory, configuration, and physical topology) is collected and updated in Cisco MGM. By default, periodic, routine discovery occurs every 24 hours, beginning from the time the Cisco MGM server starts.

4.2.5 Copying a Network Element from One Group to Another

Groups for multiple NEs can easily be created in Cisco MGM. For information about creating groups, see Section 4.3 How Do I Build Groups? The same NE can be copied into different groups.

Step 1 In the Domain Explorer Hierarchy pane, select the NE to be copied.

Step 2 Choose **Edit > Copy** (or click the **Copy** tool). This copies the NE to the clipboard. (Notice that the NE ID now appears in italics).

Step 3 Select the group or management domain node where the NE will be pasted and choose **Edit > Paste** (or click the **Paste** tool). This pastes the contents of the clipboard under the selected node.

Note An NE cannot be pasted into the Discovered Network Elements or Deleted Network Elements group. Also, it cannot be pasted into a group where the same instance of the NE already exists.

Tip The drag-and-drop feature can also be used to copy NEs. Hold down the **Ctrl** key on the keyboard and use the mouse to drag and drop the NE to a new location.

Topology modification using drag and drop or copy, cut and paste is not allowed for users with Assign NEs property (Provisioner, Operator, and custom user profile) since they cannot see the entire domain.

Note Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

4.2.6 Moving a Network Element from One Group to Another

Cisco MGM provides drag-and-drop capabilities to allow you to easily move NEs from one group to another.

Step 1 In the Domain Explorer Hierarchy pane, select the NE to be moved.

Step 2 Choose **Edit > Cut**, then **Edit > Paste**. You can also use the mouse to drag and drop the selected NE to a new location.

Note You are not allowed to copy or move NEs into the Discovered Network Elements group.

Note Topology modification using drag and drop or copy, cut and paste is not allowed for users with Assign NEs property (Provisioner, Operator, custom user profile) since they cannot see the entire domain.

4.2.7 Deleting Network Elements

From the Domain Explorer Hierarchy pane, you can delete a single NE, multiple NEs, or out-of-service NEs:

- 4.2.7.1 Deleting a Single Network Element
- 4.2.7.2 Deleting Multiple Network Elements
- 4.2.7.3 Removing a Deleted Network Element

4.2.7.1 Deleting a Single Network Element

To delete a single NE:

Step 1 In the Domain Explorer Hierarchy pane, select the NE that will be deleted. The Network Element Properties sheet appears.

Step 2 There are two options to place an NE Out of Service:

- In the **Status** tab of the Network Element Properties sheet, set the Operational State field to **Out of Service**; then, click **Save**.
- In the Domain Explorer, right click on the node and choose **Mark Out of Service**.

Step 3 In the Domain Explorer Hierarchy pane, select the NE to be deleted again.

Step 4 You can delete either a selected instance of the NE or all instances of the NE:

- Deleting the selected instance of the NE—Only the specific NE that you selected in the Domain Explorer Hierarchy pane is deleted. To delete the selected instance of the NE, choose **Edit > Delete**; then, click **Yes**. If this is the last instance of the NE, the NE is placed in the Deleted Network Elements group.
- Deleting all instances of the NE—All NEs in the user domain that have the same NE ID are deleted. To delete all instances of the selected NE, choose **Edit > Delete All**; then, click **OK**. The NE is placed in the Deleted Network Elements group.

No client views for an NE can be opened in the Deleted Network Elements group. Also, no properties of a deleted NE can be modified. The deleted NE and its associated data are removed from all client views except the Domain Explorer.

Note Only out-of-service NEs can be placed in the Deleted Network Elements group.

4.2.7.2 Deleting Multiple Network Elements

To delete multiple NEs:

Step 1 For each NE that will be deleted:

a. In the Domain Explorer Hierarchy pane, select the NE that will be deleted. The Network Element Properties sheet appears.

b. Place the NE Out of Service. There are two options:

  - In the **Status** tab of the Network Element Properties sheet, set the Operational State field to **Out of Service**; then, click **Save**.
  - In the Domain Explorer, right click on the node and choose **Mark Out of Service**.

Step 2 In the Domain Explorer Hierarchy pane, select again all the NEs that will be deleted. To select multiple NEs, press and hold down the **Ctrl** button; then, click each NE that will be deleted.

Step 3 You can delete the selected instance of the NEs or all instances of the NEs:

- Deleting the selected instance of the NE—Only the specific NEs that you selected in the Domain Explorer Hierarchy pane will be deleted. To delete the selected instance of the NEs, choose **Edit > Delete**; then, click **Yes** on the confirmation dialog box. If the selected NEs are the last instance of the NE, the NEs are placed in the Deleted Network Elements group.
- Deleting all instances of the NEs—All NEs in the user domain that have the same NE ID as the NE being deleted will be deleted. To delete all instances of the selected NEs, choose **Edit > Delete All**; then, click **OK** in the confirmation dialog box. The NEs are placed in the Deleted Network Elements group.

Note Both the Delete and Delete All menu options are enabled if at least one of the selected NEs can be deleted. The confirmation dialog box lists the NEs that can and cannot be deleted.

Note You can use the mouse to drag and drop the selected NEs to the Deleted Network Elements group only if all the selected NEs can be deleted.

4.2.7.3 Removing a Deleted Network Element

A deleted NE is placed in the Deleted Network Elements group.

Step 1 In the Domain Explorer Hierarchy pane, click the Deleted Network Elements group.

Step 2 Click the NE that will be removed from the Cisco MGM domain.

Step 3 Choose **Edit > Delete**; then, click **Yes**. This removes the NE from the client view and deletes all records associated with the NE from the database.

Note

- Wait until all records associated with the NE are deleted from the database before adding them back again. Pruning operation takes about 5 minutes.
- The Deleted Network Elements group is seen by users who have add_delete_NE_group operation permission. You can purge or undelete an NE that is in the Deleted Network Elements group only if that NE was assigned to you.

4.2.8 Restoring a Deleted Network Element

You can restore an NE to its previous location in the Domain Explorer Hierarchy pane from the Deleted Network Elements group.

Step 1 In the Domain Explorer Hierarchy pane, click the Deleted Network Elements group.

Step 2 Click the NE that will be restored.

Step 3 Choose **Edit** > **Undelete**.

All instances of the NE are restored to their previous locations in the Domain Explorer Hierarchy pane.

Note If the original parent group no longer exists, Cisco MGM does not recreate the group. Instead, Cisco MGM restores the NE under the management domain node.

The Deleted Network Elements group is seen by users who have add_delete_NE_group operation permission. You can purge or undelete an NE that is in the Deleted Network Elements group only if that NE was assigned to you.

4.3 How Do I Build Groups?

A group is a collection of objects which are related in some way; for example, they may all be the same type of equipment or all belong to the same customer.

NEs in the Domain Explorer are organized in groups, which are comprised of NEs and/or other groups. NEs are often grouped geographically or by domain. The same NE or group can be assigned to different groups.

The Group Properties pane displays information about the group that is currently selected in the Domain Explorer Hierarchy pane. Table 2-1 describes the Status tab fields. Table 2-2 describes the Identification tab fields.

This section contains the following information:

- 4.3.1 Adding Groups
- 4.3.2 Copying Groups
- 4.3.3 Moving Groups
- 4.3.4 Deleting Groups

4.3.1 Adding Groups

Step 1 Select a node or group in the Domain Explorer Hierarchy pane.

Note Adding a new group to the Discovered NEs or Deleted NEs group is not allowed.

Step 2 Choose **File** > **New Group** (or click the **Add a New Group** tool). The New Group dialog box appears.

Step 3 Enter the following information in the New Group dialog box.

Table 4-2 Field Descriptions for the New Group Dialog Box

Field	Description
Group ID	Enter a unique name for the group.
Location Name	Enter a geographic location for the group.
Description	Enter a description of the group.

Step 4 Click **OK**.

4.3.2 Copying Groups

Domains for multiple users can easily be created in Cisco MGM. Just copy the same groups in different domains, so that users who work different shifts can use the same group.

Step 1 In the Domain Explorer Hierarchy pane, select the group to be copied.

Step 2 Choose **Edit > Copy** (or click the **Copy** tool). This copies the group to the clipboard. (Notice the group name now appears in italics.)

Step 3 Select the location where the group will be pasted and choose **Edit > Paste** (or click the **Paste** tool). This pastes the contents of the clipboard under the selected group.

Note A group cannot be pasted into the Discovered NEs or Deleted NEs group.

Tip The drag and drop feature can also be used to copy groups. Hold down the **Ctrl** key and use the mouse to drag and drop the group to a new location.

Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

4.3.3 Moving Groups

Cisco MGM provides drag-and-drop capabilities to easily move groups in the Domain Explorer Hierarchy pane.

Step 1 In the Domain Explorer Hierarchy pane, select the group to be moved.

Step 2 Use the mouse to drag and drop the selected group to a new location.

Note Groups cannot be moved into the Discovered NEs or Deleted NEs groups.

Tip The Cut and Paste tools can also be used to move groups.

Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

4.3.4 Deleting Groups

Cisco MGM allows you to delete a single group or multiple groups:

- 4.3.4.1 Deleting a Single Group
- 4.3.4.2 Deleting Multiple Groups

4.3.4.1 Deleting a Single Group

Step 1 In the Domain Explorer Hierarchy pane, select the group to be deleted.

Step 2 You can delete either the selected instance of the group or all instances of the group:

- To remove the selected instance of the group, choose **Edit > Delete**; then, click **Yes** in the confirmation dialog box.
- To remove all instances of the selected group, choose **Edit > Delete All**; then, click **Yes** in the confirmation dialog box.

Note Before deleting the last instance of a group, the group must be empty. Move all of the NEs and groups that the group contains to a different group.

4.3.4.2 Deleting Multiple Groups

Step 1 In the Domain Explorer Hierarchy pane, select the group to be deleted. Select multiple groups by pressing and holding down the **Ctrl** key, then click each group that will be deleted.

Step 2 You can delete either the selected instance of the groups or all instances of the groups:

- To remove the selected instance of the groups, choose **Edit > Delete**; then, click **Yes** in the confirmation dialog box.
- To remove all instances of the selected groups, choose **Edit > Delete All**; then, click **Yes** in the confirmation dialog box.

Note Before deleting the last instance of a group, the group must be empty. Move all of the NEs and groups that the group contains to a different group.

4.4 How Do I Configure the SNMP Community String?

Cisco MGM configures the community strings for SNMP management and supports various multi-service-switching devices.

Caution The community strings on the devices and the community strings used by Cisco MGM do not sync up automatically (except at the initial stage when the community strings on the devices are at default).You have to explicitly change them on both sides (using the Network Element Property pane in the Domain Explorer on Cisco MGM and the command line interface (CLI) on the switch). See 4.4.2 Changing Community Strings Using the Domain Explorer and 4.4.3 Changing Community Strings Using the CLI. If this is not done, all SNMP requests fail, and the Cisco MGM database is inconsistent with the network.

To configure the SNMP community string, you must change the community strings on the devices through the CLI. SSH or Telnet to the switch to configure the community strings at the switches. The community strings are configured for the Cisco MGX PXM45-based products (Cisco MGX 8880, and Cisco MGX 8850 (PXM45)).

Table 4-3 describes the various options involved in configuring the SNMP.

Table 4-3 SNMP Configuration Options

Option	Description
Domain Explorer, Network Element Property pane, NE Authentication tab	After saving the community strings information, the Cisco MGM processes use the new community strings for SNMP accesses. Since users must configure the community strings on both the devices through CLI, and at the Cisco MGM stations through the Domain Explorer, there is a possibility of typing in mismatched community strings. This results in the node with the mismatched community strings either not discovered or unreachable to Cisco MGM. **Note** Configured community strings cannot contain underscore (_) or at (@) signs. Also, spaces are not allowed in community strings and Service Level passwords.
SNMP access security	Enter the **cnfsnmp** command on Cisco MGM by using a secured shell to change the community strings and passwords.

These tasks are used to configure the SNMP community string:

- 4.4.1 Setting Up Nonstandard Community Strings
- 4.4.2 Changing Community Strings Using the Domain Explorer
- 4.4.3 Changing Community Strings Using the CLI
- 4.4.4 Changing Service Level Passwords Using the Domain Explorer
- 4.4.5 Changing the Service Level Passwords Using the CLI

4.4.1 Setting Up Nonstandard Community Strings

The standard community strings are defined as default community strings. If you configure the standard community strings to a different value, the standard community strings are then defined as nonstandard community strings.

To set up nonstandard community strings or to change an Service Level password, use the NE Authentication tab in the Domain Explorer.

Note This method will affect only Cisco MGM. You must make sure that community strings and passwords within Cisco MGM are in agreement with those on the switches.

4.4.2 Changing Community Strings Using the Domain Explorer

To change the SNMP `get` and `set` community strings for selected nodes:

Step 1 In the Domain Explorer Hierarchy pane, select the node.

Step 2 In the NE Authentication tab, you can change the SNMP Community String to change the SNMP get community string, or change the SNMP Set Only Community String.

Step 3 Click **Save**.

4.4.3 Changing Community Strings Using the CLI

To change the SNMP `get` community strings for selected nodes:

Step 1 Open a terminal window and SSH or Telnet to the switch.

Step 2 Enter the **cnfsnmp** command to change the SNMP get community string for the selected nodes as follows:

```
xxyyzz% cnfsnmp community [ro|rw]
```

where ro is the SNMP get community string and rw is the SNMP set only community string

Step 3 Configure the SNMP get community string for the selected switch as follows:

```
xxyyzz%cnfsnmp community public ro
xxyyzz%
```

Then check that the community string has changed. Enter:

```
dspsnmp
```

You will see output similar to the following example:

```
xxyyzz.7.PXM.a > dspsnmp
xxyyzz System Rev: 05.00 Dec. 14, 2004 20:04:14 GMT
MGX8850 Node Alarm: MAJOR
Community (rw): private
Community (ro): public
System Location: building 3
System Contact:
```

To change the SNMP `set` community strings for a node or switch:

Note The following procedure changes the SNMP set community string for the node that you SSH or Telnet to, not for all instances of that node. You must change the SNMP set community string on all instances of the node.

Step 1 Open a terminal window and SSH or Telnet to the switch.

Step 2 Enter the **cnfsnmp** command to change the SNMP `set` community string for all nodes as follows:

```
xxyyzz% cnfsnmp community private rw
xxyyzz%
```

Then check that the community string has changed. Enter:

```
dspsnmp
```

You will see output similar to the following example:

```
xxyyzz.7.PXM.a > dspsnmp
xxyyzz System Rev: 05.00 Dec. 14, 2004 20:04:14 GMT
MGX8850 Node Alarm: MAJOR
Community (rw): private
Community (ro): public
System Location: building 3
System Contact:
```

4.4.4 Changing Service Level Passwords Using the Domain Explorer

To change the Service Level password for the current Service Level user for all nodes:

Step 1 In the Domain Explorer Hierarchy pane, select the node.

Step 2 In the NE Authentication tab, change the NE Service Level Password. Confirm the change, enter the password in the Confirm NE Service Level Password field.

Step 3 Click **Save**.

4.4.5 Changing the Service Level Passwords Using the CLI

To change the Service Level password for the current Service Level user:

Note The following procedure changes the Service Level Password for the node that you SSH or Telnet to, not for all instances of that node. You must change the Service Level Password on all instances of the node.

Step 1 Open a terminal window and SSH or Telnet to the switch.

Step 2 Enter the **cnfpasswd** command to change the Service Level password for all nodes. The following example is shown:

```
xxyyzz.7.PXM.a >
xxyyzz.7.PXM.a > cnfpasswd
Enter existing password:
Enter new password:
Re-enter new password:
Local password for user cisco changed.
```

Step 3 When you are prompted for a password, you must:

a. Enter the existing password.

b. Enter the new password.

c. Reenter the new password for confirmation.

4.5 How Do I Build Network Maps?

Network map backgrounds are provided by default as part of Cisco MGM, and are used to display a geographical layout of the network.

The Network Map consists of three areas:

- The right side displays a map with the individual groups, NEs, and link icons.
- The upper left side displays the position of the map on the right side with respect to a larger world map.
- The lower left side displays the domain, or group properties, including the number of alarms and ID.

This section contains the following information:

- 4.5.1 Customizing a Network Map
- 4.5.2 Viewing a Node in the Network Map
- 4.5.3 Modifying a Node Icon or a Map Background Image
- 4.5.4 Saving Changes to the Network Map

4.5.1 Customizing a Network Map

Step 1 In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map** (or click the **Open Network Map** tool). See Figure 4-2.

Note There is no Network Map for the Discovered NEs or Deleted NEs groups.

Step 2 Use the Edit menu in the Network Map window to customize the Network Map. The Edit menu options are detailed in Edit Menu OptionsTable 4-4.

Table 4-4 Edit Menu Options

Edit Menu Option	Description
Enable Drag	Enables the drag-and-drop functionality.
Enable Offview	Enables the display of off-view icons in the selected Network Map window. If an NE has a link to an NE on a different map, the off-view NE is represented by an off-view icon. **Note** The off-view icon serves as a hyperlink to the map that contains the NE at the opposite end of the link.

Table 4-4 Edit Menu Options (continued)

Edit Menu Option	Description
Change Map Background	Choose a different geographic background image for the selected view. Choose one of the image files packaged with Cisco MGM, or use another image file (not packaged with Cisco MGM).
Change Node Icon	Choose a new icon for the selected node.
Zoom In	Choose to change the magnification of the icons.
Zoom Out	Choose to make all nodes visible.
Zoom Area	Selects the area that you want to view. When selected, the pointer changes to a cross mark in the Network Map and allows you to select the area that you want to view.
Circular Layout	Arranges and displays the nodes in a circle.
Spring Layout	Arranges and displays the nodes according to the links that connect the NEs.
Table Layout	Arranges and displays the nodes in such a way that the nodes are arranged in a grid, or table. The nodes are arranged as close together as possible.
Declutter Layout	Arranges the existing nodes so that they do not overlap. This layout is used to handle nodes that appear on top of each other when you zoom out.

Step 3 The off-view icons in the Network Map can be enabled or disabled. To enable or disable the off-view icons:

a. Choose **Edit > User Preferences**.

b. Click the **Map Preferences** tab.

c. Check the **Show Off View Icons** check box to show off-view icons in the Network Map, or leave the check box unchecked to hide off-view icons.

d. Click **OK**.

Step 4 Choose whether Cisco MGM truncates long map node names by the first characters or by the ending characters:

a. Return to the Domain Explorer window and choose **Administration > Control Panel**.

b. Click **UI Properties**.

c. In the Domain Management area, specify the truncation preference and click **Save**.

Step 5 Choose whether to use multiple windows or a single window for navigation:

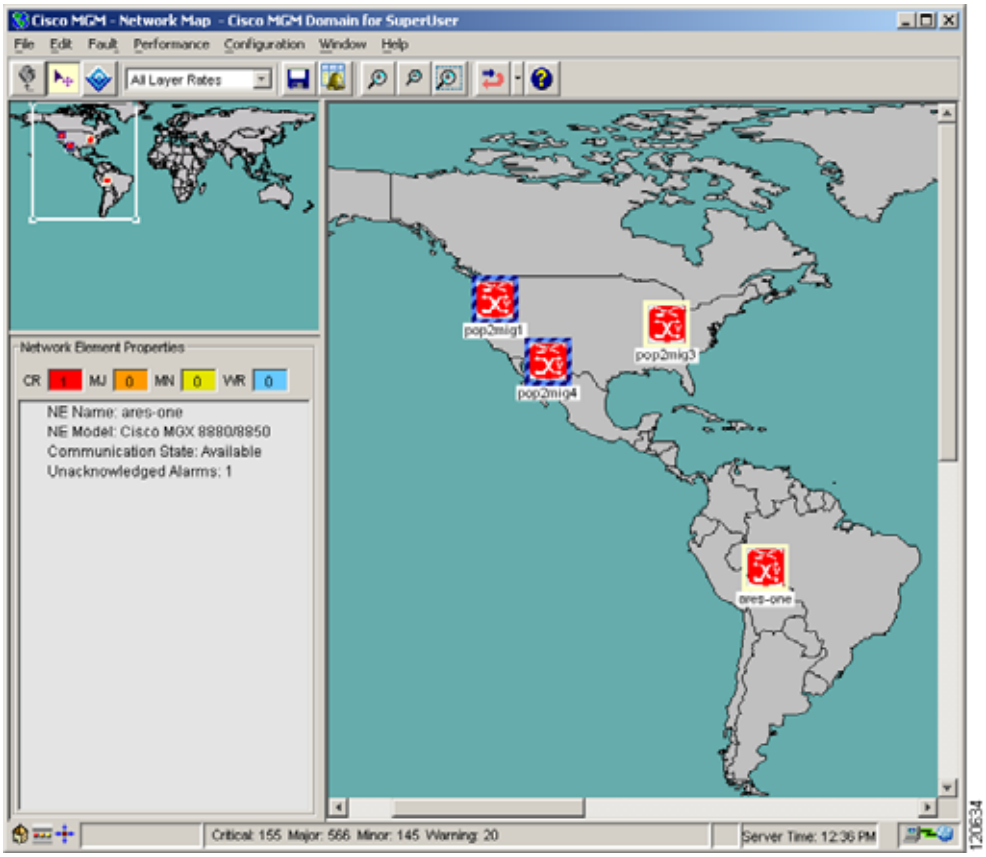
a. Choose **Edit > User Preferences**.

b. Click the **Map Preferences** tab.

c. Check the **Open Network Map in New Window** check box to open a new window for subsequent map views, or uncheck the check box to open subsequent map frames in the same window.

d. Click **OK**.

Figure 4-2 Network Map Window



4.5.2 Viewing a Node in the Network Map

Icons in the Network Map are displayed based on the nodes you select in the Domain Explorer.

Launching the Network Map from the following nodes displays different results:

- From the Cisco MGM domain in the Domain Explorer—Displays all the groups in the Cisco MGM Domain. If you double-click on a group in the Network Map, another Network Map window appears and all the NEs that belong to that group are displayed.
- From a particular group in the Domain Explorer—Displays all NEs that belong to that group.
- From a specific NE in the Domain Explorer—Displays the selected NE.

When the Network Map is launched from the Cisco MGM domain, it displays a world map with the individual groups, network partition, or NEs icons. To view a particular region or icon, adjust the zoom level or pan position.

4.5.2.1 Adjusting the Zoom Level or Pan Position

Step 1 In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. The Network Map appears and the node is preselected. See Figure 4-2.

Step 2 In the Network Map, choose **Edit > Zoom In**, **Edit > Zoom Out**, or **Edit > Zoom Area** to adjust the zoom level. You can also click the **Zoom In**, **Zoom Out**, or **Zoom Area** tool.

Step 3 To adjust the pan position, click the box in the upper-left side of the Network Map and use the mouse to drag and drop it to the desired region. Use the scroll bars to pan the view to a different region.

Step 4 To adjust the pan position area, use the mouse to click the corner of the box, and drag to include the required area.

4.5.3 Modifying a Node Icon or a Map Background Image

Appendix A, "Icons and Menus" details the icons which are used in Cisco MGM.

The icons in the Network Map can be customized. Images smaller than 640 x 480 pixels by default appear surrounded by blank space in the upper-left corner of the window. Images larger than 1024 x 768 pixels by default appear with scroll bars. Icon images are 32 x 32 pixels. Cisco MGM supports nonanimated GIF and shapefile format icons and maps. Shapefile is a universal standard for data file that allows users to zoom in and zoom out without losing details.

Note The size of the map file should not exceed 100 KB.

This section contains the following information:

- 4.5.3.1 Modifying a Node Icon
- 4.5.3.2 Modifying a Map Background

4.5.3.1 Modifying a Node Icon

Step 1 In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See Figure 4-2.

Step 2 In the Network Map window, click a node and choose **Edit > Change Node Icon**. The Select Node Icon File dialog box appears.

Step 3 Select a node icon from within the default file system at C:\Cisco\MediaGatewayManagerClient\images\mapicons for Windows systems or at /opt/CiscoMGMClient/images/mapicons for Unix systems.

Step 4 After choosing an icon, click **Open**. The new icon appears in the Network Map.

Step 5 Choose **File > Save** to save the changes.

4.5.3.2 Modifying a Map Background

Step 1 In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See Figure 4-2.

Step 2 In the Network Map window, click in the map background and choose **Edit > Change Map Background** or right-click in the map background and choose **Change Map Background**. The Select Background Map dialog box appears.

Step 3 Select a background image from within the default file system at C:\Cisco\MediaGatewayManagerClient\images\mapbkgnds for Windows systems or at /opt/CiscoMGMClient/images/mapbkgnds for Unix systems. Add user-defined images in this file system, or click **Create New Folder** and save user-defined images in a customized folder within this directory.

Step 4 After choosing a map background, click **Open**. The new map background appears in the Network Map.

Step 5 Choose **File > Save** to save the changes.

Note When you add NEs or groups to a group or to the top-level domain, the coordinates of those objects on the related Network Map are initially null, so Cisco MGM automatically positions the objects. If you move an object manually and save the map, the object has fixed coordinates. Therefore, if you open a map and find an icon in an unexpected position, the object most likely was never positioned manually and saved and was therefore positioned automatically. To fix the icon location, manually move the object to the correct position and save the map.

4.5.4 Saving Changes to the Network Map

Step 1 In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See Figure 4-2.

Step 2 After making the necessary changes to the map background, node icon, and node coordinates in the Network Map window, you can save your settings by using one of the following methods:

- Save—Choose **File > Save** (or click the **Save Changes** tool) to save your settings. Your settings become a custom map that does not affect the default map for the nodes currently displayed in the Network Map. Users who have not saved their custom map will still see the default map for those nodes.
- Save As Default—Choose **File > Save As Default** to save your settings as the default settings. Your settings become the default map for the nodes under subgroups currently displayed in the Network Map and this default map is seen by users who have not saved their custom map for those nodes. There can only be one default setting per group of nodes in the Network Map.

Note The Save As Default menu option is disabled on the Cisco MGM Management Domain node.
Save As Default is only available for nodes under sub-groups.

- Revert To Default—Choose **File > Revert to Default** to cancel your settings and revert to previous settings. Any custom map you created for the nodes under subgroups currently displayed in the Network Map will be erased. The Network Map reverts to the default map assigned to these nodes.

Note **Revert to Default** is only available for nodes under sub-groups.

4.6 How Do I Discover the Network?

The Cisco MGM discovery service:

- Collects information from individual MGX8880 and MGX8850 NEs
- Discovers new NEs
- Updates device-level information (such as inventory and alarms).

Cisco MGM supports discovery for MGX8880 and MGX8850 chassis and sub-chassis components using IP addresses, address list, or IP address range as input.

The specific NE components to be discovered and displayed in the EMS GUI are:

- PXM45 card
- VXSM card
- VISM-PR card
- RPM-XF card
- RPM-PR card
- AXSM/B card
- AXSME card
- SRME card
- SRME/B card
- Connections

Cisco MGM provides sub-chassis component discovery (configuration upload and parse) and sync up, as well as, autonomous traps processing of configuration changes. Sync up is initiated periodically.

Note The Discovered Network Elements group can only be viewed by SuperUsers and NetworkAdmins in cases where all NEs are assigned to them. Therefore, in the Add Network Element(s) wizard, the grouping option “Group the Discovered NE(s) in the Discovered Network Elements Group” is not available.

This section contains the following information:

- 4.6.1 Discovering NEs

4.6.1 Discovering NEs

The network discovery service in Cisco MGM collects information from individual NEs, discovers new NEs added to the network, and computes network-level information, such as physical topology, and discrepancies.

When you add a new NE to Cisco MGM, the discovery process starts. When the process finishes, all of the NE information (such as inventory, configuration, physical topology, and discrepancies) is collected and Cisco MGM is updated.

4.7 How Do I Synchronize the Network?

The Cisco MGM server and managed nodes must be synchronized with the same date and time. If the Cisco MGM server and managed nodes do not have the same date and time, there might be inconsistencies in retrieving time-sensitive data.

This section contains the following information:

- 4.7.1 Viewing Clocking Sources

4.7.1 Viewing Clocking Sources

Cisco MGM supports manual clock configuration. This configures both a primary and secondary clock source, which are distributed throughout the network. The secondary clock source takes over if the primary clock source fails. You can configure a network setup with one master clock source, and a secondary to ensure network clock stability.

On Cisco MGX 8850 (PXM45) switches, clock source configuration is done on a PXM45 card, and clock sourcing information is passed to other nodes over AXSM lines.

Clock synchronization is done directly on the Cisco MGM8880 using the CLI.

These topics are used to manage and configure clocking sources:

- 4.7.1.1 Configuring Global Clocking
- 4.7.1.2 Displaying the List of Available Clock Sources
- 4.7.1.3 Displaying the List of Manual Clock Sources
- 4.7.1.4 Creating a Manual Clock Source

4.7.1.1 Configuring Global Clocking

To configure global clocking:

Step 1 In the Domain Explorer Hierarchy pane, right-click the node and choose **Configuration** > **MGX8880/8850 MGX** > **Configuration Center**.

Step 2 Drag and drop the node from the Hierarchy pane to the right hand pane.

Step 3 Click the **Elements** tab to display the Configuration Window for Elements.

Step 4 Click the **Clocking** tab to display Global Clocking Configuration window. See Figure 4-3.

Step 5 Choose **Global Clocking Configuration** from the **Category** drop-down arrow.

Step 6 The **Distribution Method** is **manual**. This specifies that the network clock source is statically configured in the device.

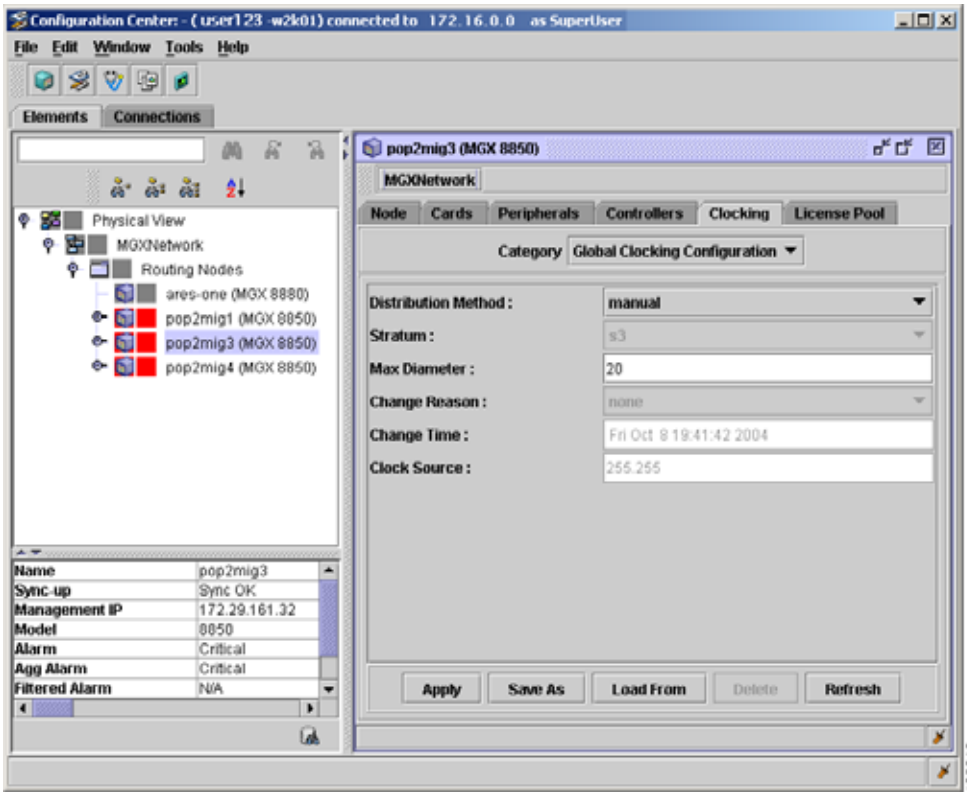
Step 7 Enter the maximum network diameter, measured in hops, in the **Max Diameter** field.

The range is from 3-20. The default value is 20.

Note Change Time—The time when the global clocking was configured.
Clock Source—The clock source from the list of available clocking source

Step 8 Click **Apply** to apply the global clocking configuration settings.

Figure 4-3 Configuration Center—Clocking Tab



4.7.1.2 Displaying the List of Available Clock Sources

To display the available clock sources:

Step 1 In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Clocking** tab to display Clocking Configuration window. See Figure 4-3.

Step 4 Choose **Available Clock Sources** to display the list of available clock sources from the **Category** drop-down arrow.

4.7.1.3 Displaying the List of Manual Clock Sources

To display a list of manual clock sources:

Step 1 In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Clocking** tab to display Clocking Configuration window. See Figure 4-3.

Step 4 Choose **Manual Clock Sources** from the **Category** drop-down arrow.

4.7.1.4 Creating a Manual Clock Source

To create a manual clock source:

Step 1 In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Clocking** tab to display Clocking Configuration window. See Figure 4-3.

Step 4 Choose **Manual Clock Sources** from the **Category** drop-down arrow.

Step 5 Click **Create** to display the Manual Clock Source Configuration Window.

Step 6 Choose one of the following clock source options from the **Priority** drop-down arrow:

- **primary**— Configures an available network clock source to be the primary manual clock source.
- **secondary**—Configures an available network clock source to be the secondary manual clock source.
- **default**—Configures an available network clock source to be the default manual clock source.

Step 7 Enter the index value that is used to identify the primary, secondary, or default manual clock source in the **Clock Source Index** field.

Step 8 Enter the description of the clock source in the **Clock Source** field.

Step 9 Ensure that the health of the clock source is correct from the **Health** drop-down arrow.

Step 10 Click **Apply** to create a manual clock source.

4.8 How Do I Test Connectivity?

Note A diagnostic check can be run at the node level to verify that selected nodes are being managed correctly by Cisco MGM. See "5.2.10.2 Running a Diagnostic Check at the Node Level".

Testing NE connectivity occurs at the management protocol level (SNMP, or CORBA).

Step 1 In the Domain Explorer Hierarchy pane, select the NE and choose **Fault > Diagnostic Center**.

Step 2 Click the **Manageability** tab to display the Node Login Information.

Step 3 Enter the Service Level username and password.

Step 4 Click **Check Manageability**. The following Manageability Check Results are displayed:

- Node ID
- Node Name
- IP Reachability
- FTP Configuration
- Community String Configuration
- Trap IP Configuration

Maintaining an Efficient Network

This chapter contains the following information to help you maintain an efficient network:

- 5.1 How Do I Manage the Database?
- 5.2 How Do I Monitor the Network?
- 5.3 How Do I Modify the Network?
- 5.4 How Do I Manage the Network Software?
- 5.5 How Do I Manage Redundancy and Failover?
- 5.6 Which Ports Are Reserved in Cisco MGM?
- 5.7 How Do I Export Information in Tables?

Note For information on configuring users and user-related parameters, creating and modifying advisory messages, and accessing various logs, please refer to Chapter 8, "Managing Security".

Maintaining your network focuses on tasks that will keep your network running smoothly, for example:

- Backing up and restoring memory and/or the database
- Restoring default settings when necessary
- Monitoring tasks and jobs
- Modifying basic server and NE information
- Finding modules or boards
- Updating software images and versions
- Exporting data and generating reports
- Performing administrative database operations

5.1 How Do I Manage the Database?

This section describes procedures for managing the Oracle database and deals specifically with Cisco MGM data stored in the database. For a complete description, refer to the Oracle documentation—specifically the *Oracle9i Server Administrator's Guide*.

A useful tool for managing the database is the Oracle Enterprise Manager, part of the Oracle9i Client CD. The Oracle Enterprise Manager provides an integrated solution for managing heterogeneous environment and combines a graphical console, agents, common services, and tools to provide a comprehensive systems-management platform for managing Oracle products.

This section contains the following information:

- 5.1.1 Viewing and Modifying Database Properties
- 5.1.2 Importing and Exporting Data to and from the Oracle Database
- 5.1.3 Backing Up and Restoring the Database
- 5.1.4 Pruning the Database
- 5.1.5 Using the SQL*PLUS Client to Manage the Database
- 5.1.6 Basic SQL Commands for Cisco MGM Schema Objects
- 5.1.7 Enhancing Database Performance
- 5.1.8 Removing an Old Version of the Cisco MGM Database

5.1.1 Viewing and Modifying Database Properties

The Database Properties pane shows and defines database pruning parameters and configuration that the Cisco MGM server uses to connect to the Oracle database. It contains the following tabs:

- Configuration Tab—The Configuration tab fields define the values used by the Cisco MGM server to log into the Oracle database. Fields are grouped into two columns: Active and After Restart. The Active column displays the values used by the Cisco MGM server. The After Restart column shows the values that the Cisco MGM server uses after the server is restarted.

Note Table 5-1 describes the fields within the Database Properties Configuration tab.

- Pruning Tab—The Pruning tab defines the Cisco MGM database pruning frequency. Pruning frequency changes take effect as soon as you save them. You do not need to reboot the Cisco MGM server.

Note Table 5-2 describes the fields within the Database Properties Pruning tab.

- Database Backup Tab—The Database Backup tab allows you to start a database backup from the Control Panel. After entering the password, click **Start** to begin the database backup. This tab is disabled if the database is not installed in ARCHIVELOG mode. The ARCHIVELOG mode is stored in the MGM_config_table by the server installer.

Note Table 5-3 describes the fields within the Database Properties Database Backup tab.

To view and modify the database properties:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 Click **Database Properties** to open the Database Properties pane. See Figure 5-1.

Step 3 (Optional) Click the **Configuration** tab. Table 5-1 describes the fields within the Database Properties Configuration tab.

Step 4 (Optional) Click the **Pruning** tab. Table 5-2 describes the fields within the Database Properties Pruning tab.

Note For more details, see section 5.1.4 Pruning the Database, page 5-13.

Step 5 (Optional) Click the **Database Backup** tab. Table 5-3 describes the fields within the Database Properties Database Backup tab.

Note For more information on database backups, see section 5.1.3 Backing Up and Restoring the Database, page 5-7.

Note Fields in the Database Backup tab are disabled if the database is not installed with the ARCHIVELOG mode option equal to true (see the Configuration tab for details).

Step 6 Click **Save**.

Figure 5-1 Control Panel—Database Properties Pane

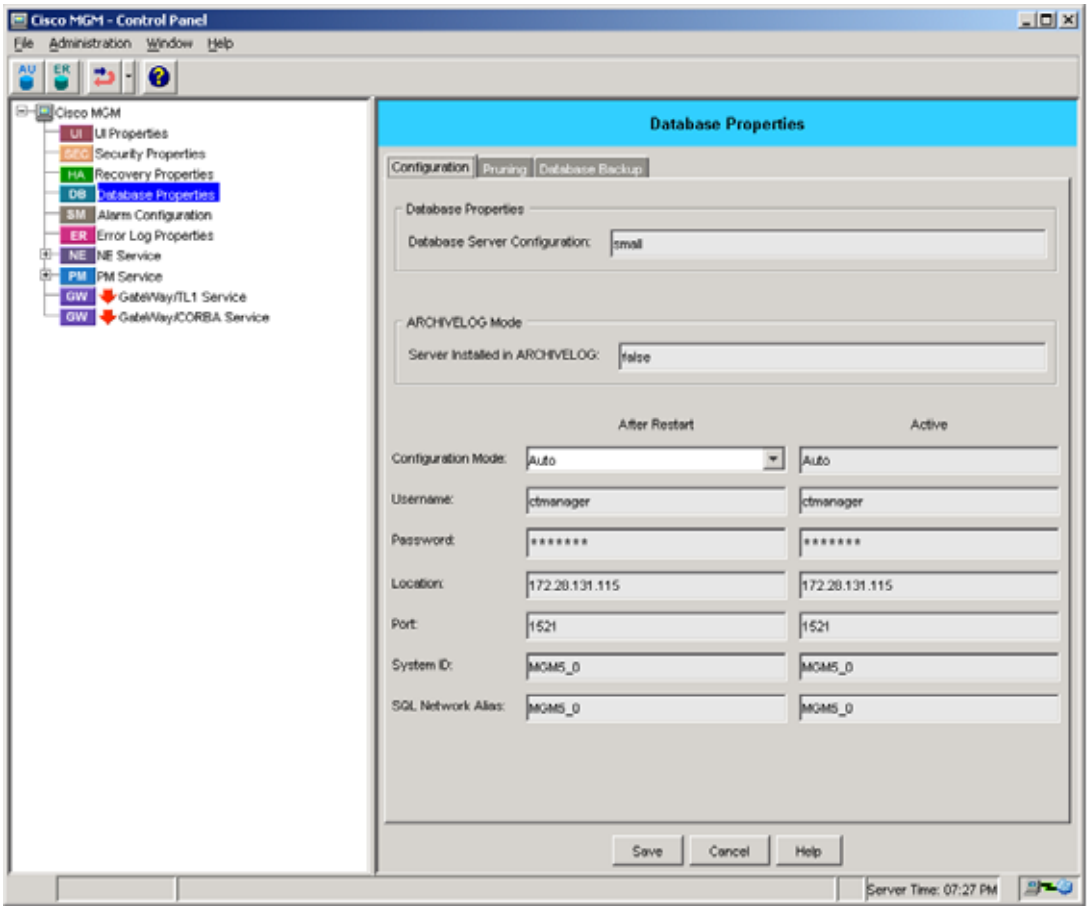


Table 5-1 Field Descriptions for the Database Properties—Configuration Tab

Field	Description
Database Server Configuration	Displays the size of the database server.
Server Installed in ARCHIVELOG	If set to True, Cisco MGM supports automatic pruning of the /db05 partition when the database is in ARCHIVELOG mode.

Table 5-1 Field Descriptions for the Database Properties—Configuration Tab (continued)

Field	Description
Configuration Mode	Configuration Mode tells the Cisco MGM server the values to use to log into the Oracle database. When set to Auto, the Cisco MGM server uses the configuration that was set when Cisco MGM was installed. When set to Manual, the After Restart fields can be edited, and the Cisco MGM server will use the edited values when the server is rebooted. **Note** If you change the configuration mode to Manual, enter the following commands to set the ORACLE_HOME and ORACLE_SID environment variables before logging into Cisco MGM again: **setenv ORACLE_HOME** *Oracle home directory* **setenv ORACLE_SID MGM5_0** **setenv LD_LIBRARY_PATH $ORACLE_HOME/lib** **setenv PATH $PATH:$ORACLE_HOME/bin** Restart the Cisco MGM server after setting these environment variables. **Caution** If you set the configuration mode to Auto and restart the Cisco MGM server, the MGMServer.cfg file is overwritten with the default values for username, password, location, port, system ID, and SQL network alias.
Username	Displays the username that the Cisco MGM server uses to access the Oracle database.
Password	Displays the password that gives the username access to the Oracle database.
Location	Displays the IP address that the Cisco MGM server uses to connect to the database.
Port	Displays the port number that is used to connect to the database.
System ID	Displays the Oracle system ID. The ORACLE_SID specifies the system identifier (SID) value of the database instance that you create with the Cisco MGM installer. For a single-instance database, the SID value should be the same as the name of the database it manipulates (initialization parameter DB_NAME), and no more than four characters. **Note** During Cisco MGM installation, the default system ID is MGM5_0.
SQL Network Alias	Displays the SQL*Net listener alias set in the system listener.ora file. When the listener is running, entering the **ps** command displays the following output (not all systems display *listener_alias*): tnslsnr [*listener_alias*] [-inherit] Shadow processes (dedicated servers) spawned by the SQL*Net listener have the following syntax: oracle*SID* [(LOCAL=NO)]

Table 5-2 Field Description for the Database Properties—Pruning Tab

Field	Description
PM Data	Specifies the number of days to save performance monitoring (PM) data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the PM data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the PM data pruning.
FM Data	Specifies the number of days to save FM data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the FM data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the FM data pruning.
Audit Log Data	Specifies the number of days to save audit log data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the audit log data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the audit log data pruning.
Error Log Data	Specifies the number of days to save Error Log data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the Error Log data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the Error Log data pruning.
Audit Trail Data	Specifies the number of days to save audit trail data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the audit trail data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the audit trail data pruning.
Self Monitor Data	Specifies the number of days to save self-monitoring data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the self monitoring data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the self monitoring data pruning.
Job Monitor Data	Specifies the number of days to save job monitoring data before Cisco MGM runs the database pruning script. The default value is 7. You can also specify the time of day when the job monitoring data will be saved by choosing the hour and minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate the job monitoring data pruning.

Table 5-3 Field Descriptions for the Database Properties—Database Backup Tab

Field	Description
Password	The password for the system user.
Backup Status	The status of the database backup.
Archive Log Pruning Parameters	Displays the archive log pruning parameters.

5.1.2 Importing and Exporting Data to and from the Oracle Database

Use the Oracle Export utility to write data from an Oracle database to an operating system file in binary format. The file is stored outside the database and read to another Oracle database by using the Import utility. For more information about using Oracle Import and Export utilities, refer to the *Oracle9i Utilities* document. Alternatively, use the Oracle Enterprise Manager to import and export data.

The Export utility provides a simple way to transfer data objects between Oracle databases. The Export utility extracts the object definitions and table data from an Oracle database and stores them in an Oracle binary-format export dump file located on disk or on tape.

The export dump file is sent by using FTP—or, if on tape, physically transported—to a different site. By using the Import utility, the export dump file is transferred between databases that reside on machines not connected through a network.

Note Only the Oracle Import utility can read export dump files.

5.1.3 Backing Up and Restoring the Database

This section describes how to back up and restore Cisco MGM data and how to use basic Oracle backup and recovery tools:

- 5.1.3.1 Overview of the Oracle Logical Backup
- 5.1.3.2 Oracle Export Utility
- 5.1.3.3 Performing a Logical Backup (Export)
- 5.1.3.4 Oracle Import Utility
- 5.1.3.5 Restoring with a Logical Backup (Import)
- 5.1.3.6 Backing Up the Database
- 5.1.3.7 Restoring the Database
- 5.1.3.8 Configuring Manual NE Backup Parameters

This section also explains the structure of /opt/CiscoMGMServer, a directory that is created automatically when you install Cisco MGM 5.0.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Cisco MGM uses an Oracle database. It is recommended that you protect your data by backing it up regularly. Backups can be stored on a local or network-mounted, disk-based file system; on a local tape drive; or on a remote tape drive.

Commercially available tools for Oracle and system-level backup include:

- Legato Networker (or “Solstice Backup” when purchased from Sun Microsystems)
- VERITAS NetBackup
- BMC Software SQL Backtrack
- GNU Oraback.sh

Caution Whenever a back up is done, it must include both the database and all other Cisco MGM directories. Likewise, whenever a restore is done, it must include both the database and all other Cisco MGM directories.

5.1.3.1 Overview of the Oracle Logical Backup

It is recommended to backup the Oracle database using a logical backup. A logical backup involves reading a set of database records and writing them to a file. These records are read independently of their physical location. Oracle uses the Export (exp) and Import (imp) utilities to perform a logical database backup.

A logical backup has the following advantages:

- Checks for corrupted data blocks and verifies database consistency
- Eliminates database fragmentation
- Allows incremental export and import to store only tables that have changed since the last export
- Is portable to another machine or database

A logical backup has the following disadvantages:

- Cannot recover transactions
- Takes longer than a physical backup
- Lacks referential integrity (export is done one table at a time)

5.1.3.2 Oracle Export Utility

The Oracle Export utility reads the database, including the data dictionary, and writes the output to a binary file called an export dump file. The created file contains all of the commands necessary to recreate the selected database objects.

The Oracle Export utility permits three types of exports:

- Complete—A full database export including the data dictionary for all tables
- Incremental—Includes all of the tables that have changed since the last full export
- Cumulative—Includes all of the tables that have changed since the last full cumulative or the last full export

Note Exporting directly to a Network File System (NFS)-mounted file system is not recommended due to the unusually large amount of data transfer required. The export dump file may be moved to an NFS-mounted system after exporting to a local file system.

Tip Save the export dump file on a file system independent from the one used by the Cisco MGM database.

5.1.3.3 Performing a Logical Backup (Export)

Complete the following steps to perform a full export of the entire database:

Note The export command is located in the /oraclesw9i/product/9.2/bin directory.

Step 1 Enter the following commands:

```
# su - oracle
% echo $ORACLE_SID
```

Note Make sure that the value of the ORACLE_SID environment variable matches the system identifier (SID) of the database instance to export. During Cisco MGM installation, the default SID for Cisco MGM 5.0 is MGM5_0. If the SID is changed during Cisco MGM installation, the new SID becomes the default SID of the system.

Step 2 Enter the following commands to begin the export:

```
% exp userid=system/manager full=Y constraints=Y file=export_filename buffer=2800000
log=/oraclesw9i/MGM-exp.log
```

5.1.3.4 Oracle Import Utility

The Oracle Import utility reads the binary export dump file created by the Export utility and executes the embedded commands.

Note The import command is located in the /oraclesw9i/product/9.2/bin directory.

The exported data does not need to be imported to the same database used to generate it. Also, it is not required that you import all the exported data. Upon a full import, the Oracle Import utility creates all the database objects, including tablespaces, data files, and users.

5.1.3.5 Restoring with a Logical Backup (Import)

This procedure assumes that the Cisco MGM database has already been created.

Note Refer to the *Cisco Media Gateway Manager 5.0 Installation Guide* to create a Cisco MGM database, if one does not already exist.

Complete the following steps:

Step 1 Insert the Cisco MGM server installation CD.

Step 2 Enter the following commands to create the mgmanager user:

```
%sqlplus /nolog << EOF
SVRMGR> connect sys/change_on_install as sysdba
SVRMGR> @/cdrom/cdrom0/mgms/create_user.sql
SVRMGR> exit
>EOF
```

Step 3 Enter the following command to import the mgmanager schema:

```
% imp system/manager file=export_filename fromuser=ctmanager touser=ctmanager commit=y
ignore=y buffer=1000000 log=mgm-imp.log
```

Step 4 Enter the following commands to recompile all invalid database objects:

```
% cd $ORACLE_HOME/rdbms/admin
% sqlplus internal
SQL> @utlrp.sql
SQL> exit
```

5.1.3.6 Backing Up the Database

Note Create a directory named /mgm_backup for storage of the database backup. This directory must be created before starting the backup.

To back up the database:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **Database Properties** to open the Database Properties pane. See Figure 5-1.

Step 3 In the Database Properties pane, click the **Database Backup** tab.

Note This option is only available if ARCHIVELOG mode was selected during the Cisco MGM installation process.

Step 4 Enter the sys Oracle user password. The password is **change_on_install**.

Step 5 Click **Start**.

Note The database backup files are stored in /mgm_backup.

The backup log files can be viewed at oraclesw9i/admin/ORACLE_SID/udump/backup_db.log.

5.1.3.7 Restoring the Database

To restore the database:

Caution Do not restore the database unless it is corrupted and inaccessible. If your database is inaccessible, your Cisco MGM server will not be running. The restore will overwrite the existing data files and restore the database from the backup files.

Step 1 If the Cisco MGM server is running, log into it as the root user and enter the following command to shut down the server:

```
mgms-abort
```

Step 2 Log into the database server.

Step 3 Enter the following commands:

```
cd /opt/CiscoMGMServer/bin
./restore_db.sh /mgm_backup /tmp
```

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Note The restore log file can be viewed at /tmp/restore_db.log

Step 4 Log into the Cisco MGM server as the root user and enter the following command to start the server:

```
mgms-start
```

Step 5 Start your Cisco MGM client(s).

5.1.3.8 Configuring Manual NE Backup Parameters

Use the NE Service Properties pane to set manual NE backup parameters.

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **NE Service** to open the NE Service Properties pane. Click the **NE Manual Backup** tab. Table 5-4 describes the fields in the NE Manual Backup tab.

Step 3 Click **Save**. Changes take effect immediately; however, the backup already scheduled for the next 24 hours remains in effect. A backup with the new parameters will occur after the previously scheduled backup runs.

Table 5-4 NE Service—NE Manual Backup Tab

Field	Subfield	Description
Select Modify Mode	—	Allows you to specify whether the manual backup should apply to a specific NE model or to all applicable NE models.
Configuration Parameters	Number of Backup Copies	Allows you to specify the number of backup copies to keep (the default is 7). Each time Cisco MGM creates a new backup file it checks the existing number of backup copies. Cisco MGM deletes files as needed, beginning with the oldest file, so as not to exceed the specified number of backup copies to keep.

5.1.3.9 Configuring Automatic NE Backup Parameters

Use the NE Service Properties pane to set automatic NE backup parameters.

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **NE Service** to open the NE Service Properties pane. Click the **NE AutoBackup** tab. Table 5-5 describes the fields in the NE AutoBackup tab.

Step 3 Click **Enable Auto Backup**.

Step 4 Click **Save**. Changes take effect immediately; however, the backup already scheduled for the next 24 hours remains in effect. A backup with the new parameters will occur after the previously scheduled backup runs.

Table 5-5 NE Service—NE AutoBackup Tab

Field	Subfield	Description
Select Modify Mode	—	Allows you to specify whether the manual backup should apply to a specific NE model or to all applicable NE models.
Configuration Parameters	NE Model	If NE Model is selected under Select Modify Mode, this field allows you to specify the NE model that will be backed up manually.
	Backup Frequency	Default value that defines the backup frequency.
	Number of Backup Copies	Allows you to specify the number of backup copies to keep (the default is 7). Each time Cisco MGM creates a new backup file it checks the existing number of backup copies. Cisco MGM deletes files as needed, beginning with the oldest file, so as not to exceed the specified number of backup copies to keep.
Backup Time	—	Time when the backup is scheduled to begin.

5.1.4 Pruning the Database

Cisco MGM provides features to prune the database. Pruning is the removal of information that is deemed old or less significant, and can include the following data:

- Fault Management data
- Performance data
- Audit Trail data
- Audit Log data
- System Log Error Log
- Self Monitor data
- Job Monitor data

You can change the pruning settings using the Control Panel. You can select when exactly the pruning has to occur daily (at non-peak hours like 00:00 hrs), and can also select the pruning period (like prune all data except data for the last 7 days).

Note Pruned data is entirely lost from the database.

5.1.4.1 Setting the Time and Date for Automatic Pruning

Choosing to prune the database automatically prunes daily all PM data, FM data, audit log data, audit trail data, and Error Log data older than the specified retention period. To configure automatic database pruning:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **Database Properties** to open the Database Properties pane. See Figure 5-1.

Step 3 In the Database Properties pane, click the **Pruning** tab. Table 5-2 describes the fields in the Database Properties Pruning tab. The following information is displayed:

- PM data
- FM data
- Audit Log data
- Error Log data
- Audit Trail data
- Self Monitor data
- Job Monitor data

Step 4 Click **Enable** for each field as desired, and set the number of days and time of pruning.

Step 5 After making the selections, click **Save**. Changes take effect immediately.

5.1.4.2 Using Pruning Scripts

Running database pruning scripts allows you to prune Cisco MGM data from the Oracle database at any given time. Pruning scripts allows you to prune the following types of data:

- Audit log data
- Audit trail data
- Error log data
- Event data
- All PM data
- NEs and all related information
- Server monitoring data

Note For information about pruning NEs in a high availability environment, refer to the *Cisco Media Gateway Manager 5.0 High Availability Installation Guide*.

To use a pruning script:

Step 1 Log in as the root user on the Sun Solaris workstation where the Cisco MGM server is installed.

Step 2 Enter the following command to change to the Cisco MGM server bin directory:

```
cd /opt/CiscoMGMServer/bin
```

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Step 3 Enter the following command to see a list of pruning scripts:

```
ls -al prune*
```

Step 4 Select a script and a parameter (based on database pruning) and enter the corresponding command on the UNIX shell.

For example, to prune Error Log data older than 25 days, enter the following command:

```
./prune_errlog.sh 25
```

Table 5-6 describes parameters that can be passed to each script and the tables that are affected.

Table 5-6 Database Pruning

What to Prune (Script Name)	Tables Affected	Input Parameters	Remarks
Prune audit log data (prune_auditlog.sh)	transaction_log_table	Number of days 1–31	Removes all audit log entries that were created before *n* days.
Prune error log data (prune_errlog.sh)	error_log_table	Number of days 1–31	Removes all transaction log entries that were created before *n* days.

Table 5-6 Database Pruning (continued)

What to Prune (Script Name)	Tables Affected	Input Parameters	Remarks
Prune alarm and event data (prune_fm.sh)	alarm_event_table active_alarm_table	Number of days 1–31	Removes all alarm and event entries that were created before *n* days.
Prune admin job table (prune_admin_job_table.sh)	admin_job_table	Number of days 1–31	Removes all admin job entries that were created before *n* days.
Prune server monitor table (prune_server_monitor.sh)	server_monitor_table	Number of days 1–31	Removes all server monitor entries that were created before *n* days.
Prune PM data (prune_pm.sh)	all_data tables	Number of days 1–31	Removes all PM entries that were created before *n* days.
Remove an NE (prune_ne.sh) **Caution** Before running the script, shut down all Cisco MGM clients and the Cisco MGM server. See the "1.4.1 Starting and Stopping the Cisco MGM Server" section on page 1-6.	active_alarm_table additional_device_info admin_job_table alarm_count_table alarm_event_table aps_group_table audit_log_table circuit_dest_tbl circuit_span_tbl circuit_tbl circuit_vcg_tbl domain_table eqpt_info_table eqpt_relationship_table if_cross_connect if_dwdm_channel_group if_optical_phy_config_table interface_aps_info interface_dwdm_frequency interface_stack_table managed_et_tab map_cust_table mib2_interface_table ne_inventory_table ne_port_status_table ne_swimage_table	NE SYS ID	Removes all information about the NE from the database. Use this script with extreme caution.

Table 5-6 Database Pruning (continued)

What to Prune (Script Name)	Tables Affected	Input Parameters	Remarks
Remove an NE (prune_ne.sh) (continued)	???_table ????_tableoss_alarm_fltr_tid_deny_tbl pm_historical_appointments proxy_server_table server_monitor_table sway_user_port_table tca_event_table transaction_log_table unmanaged_ne_inventory_table user_map_table circuit_dest_tbl circuit_span_tbl link_table ne_info_table	NE SYS ID	Removes all information about the NE from the database. Use this script with extreme caution.
Prune server monitoring data (prune_server_monitor.sh)	server_monitor_table	Number of days 1–31	Removes all server monitoring data.

5.1.5 Using the SQL*PLUS Client to Manage the Database

To access the database and Cisco MGM schema objects, use the SQL*PLUS client that ships with Oracle products. The SQL*PLUS client is available for Microsoft Windows 2000 or NT 4.0 PCs or Sun Solaris 8 workstations. Refer to the Oracle documentation to install and run the SQL*PLUS client on a Windows 2000 or NT 4.0 PC.

On a Sun Solaris workstation, the SQL*PLUS client is installed as part of the Oracle server installation. The following guidelines are for logging into SQL*PLUS as a Cisco MGM user and managing Cisco MGM schema objects and data. Refer to the *SQL*PLUS User Guide* for a complete description.

Step 1 On the Sun Solaris machine running Oracle, log in as the Oracle owner user. Use the username that was used when installing Oracle9i.

Note To verify the username, enter the **id** command on the shell.

Step 2 Verify that the following UNIX environment variables for the Oracle user are set correctly:

- ORACLE_HOME
- ORACLE_SID
- PATH variable has $ORACLE_HOME/bin in the path
- LD_LIBRARY_PATH

Step 3 On the command line, enter the following command:

```
sqlplus ctmanager/mgm123!
```

The message "Connected to: Oracle9i..." and the SQL> prompt should appear. If not, enter the username and password again.

Step 4 Enter any SQL command supported by Oracle upon connection to SQL*PLUS. For a list of SQL commands supported by Oracle, refer to the *SQL*PLUS User Guide*.

5.1.6 Basic SQL Commands for Cisco MGM Schema Objects

Table 5-7 lists commands that display, update, or modify Cisco MGM schema objects. Run each command in SQL*PLUS by entering the command at the SQL> prompt.

Table 5-7 SQL Commands for Cisco MGM Schema Objects

SQL Command	Description
select *table_name* **from user_tables;**	Returns a list of all table names owned by the mgmanager user.
select *view_name* **from user_views;**	Returns a list of all views owned by the Cisco MGM user.
describe *table_name;*	Takes a *table_name* as a parameter (valid table names are those returned by the previous two commands) and lists the name, type, and size of columns in the table.
describe ***view_name;***	Takes a *view_name* as a parameter (valid view names are those returned by the previous two commands) and lists the name, type, and size of columns in the view.
select *col1, col2… coln* **from** *table_name;*	Takes *col1….coln* and *table_name* as parameters and displays data for all the columns listed. To display data for all columns, use an asterisk (*) instead of col1, col2, and so on.
select *col1, col2... coln* **from** *table_name* **where** *col1 = value1* **and** *col2 = value2...*	Takes *col1...coln* and *table_name* as parameters and displays data for all the columns listed that meet the condition specified in the "where" clause. For example, the command: **select nedbaccessid from ne_info_table where nesysid = 'ANGEL';** returns the value of column nedbaccessid from table ne_info_table for all rows for which nesysid = ANGEL.
select *col1, col2... coln* **from** *view_name* **where** *col1 = value1* **and** *col2 = value2...*	Takes *col1...coln* and *view_name* as parameters and displays data for all the columns listed that meet the condition specified in the "where" clause.
delete *table_name;*	Takes *table_name* as a parameter and deletes the entire contents of the table. To make the change permanent, enter **commit;** at the SQL> prompt.

Step 5 Enter the following command to start the Cisco MGM server:

```
mgms-start
```

5.1.7 Enhancing Database Performance

To improve database performance when Cisco MGM clients access Cisco MGM data, tune the Oracle database as outlined in "Part IV: Optimizing Oracle Instance Performance" in the *Oracle9i Tuning Guide*.

5.1.8 Removing an Old Version of the Cisco MGM Database

If necessary, remove all Cisco MGM schema objects from the database. However, all Cisco MGM information from the database will be deleted. An example of when to remove all Cisco MGM schema objects from the database is during reinstallation of the Cisco MGM server when data from a previously installed version is irrelevant.

To remove all Cisco MGM schema objects from the database:

Step 1 Shut down the Cisco MGM server and all Cisco MGM clients.

Step 2 On the Sun Solaris workstation running Oracle, log in as the Oracle owner user. Use the username that was used when installing Oracle9i.

Note To verify the username, enter the **id** command on the shell.

Step 3 Enter the following commands to shut down the Cisco MGM database:

```
%sqlplus /nolog << EOF
SVRMGR> connect sys/change_on_install as sysdba
SVRMGR> shutdown abort;
SVRMGR> EOF
```

Step 4 Enter the following commands:

```
cd /db01
/bin/rm -rf ORACLE_SID
```

Step 5 Change the directory to the location of the Cisco MGM Data1 tablespace (/db02).

Step 6 At the UNIX shell prompt, enter the following command:

```
ls -alR mgmdata1
```

Step 7 Enter the following commands:

```
/bin/rm -rf ORACLE_SID
/bin/rm -rf mgmdata1/ORACLE_SID*
```

Step 8 Change the directory to the location of the Cisco MGM Data2 tablespace (/db03).

Step 9 Enter the following command:

```
/bin/rm -rf mgmdata2/ORACLE_SID*
```

Step 10 Change the directory to the location of the Cisco MGM Index tablespace. This was the third directory specified during the Cisco MGM server installation. The default location is /db04.

Step 11 Enter the following command:

```
/bin/rm -rf mgmindex/ORACLE_SID*
```

5.2 How Do I Monitor the Network?

Note For specific fault monitoring informationoracle9oracle9, see Chapter 9, "Managing Faults."

This section contains the following information:

- 5.2.1 Establishing a Telnet Session to a Node
- 5.2.2 Connecting to Nodes Through Secured Shell
- 5.2.3 Monitoring a Network Element
- 5.2.4 Monitoring a Card with Chassis View
- 5.2.5 Monitoring a Line or Port with Chassis View
- 5.2.6 Monitoring Scheduled Tasks
- 5.2.7 Monitoring Service Status
- 5.2.8 Searching for a Network Element
- 5.2.9 Monitoring Cisco MGM Client/Server Configuration Details
- 5.2.10 Monitoring Network Manageability Statistics
- 5.2.11 Managing the VSI Controllers

By managing the graphical representations of the network nodes and device objects with Chassis View, you can:

- Provide status updates for nodes, cards, and lines
- Display the front or rear view of the node
- Perform provisioning tasks, such as, shelf, card, and line levels by quickly navigating to the Configuration Center
- Display the LED status for each card reflecting both standby and active states

5.2.1 Establishing a Telnet Session to a Node

To establish a telnet session to a node:

Step 1 In the Chassis View, Diagnostic Center, Configuration Center or Statistics Report tree, select the source node from the Hierarchy pane and choose **Tools > Administration > Telnet**. Or, right-click the source node and choose **Administration > Telnet**.

Step 2 When the login prompt appears in the Telnet window, you must:

a. Enter the Service Level name.

b. Enter the Service Level password.

You have successfully established a telnet session to a node.

5.2.2 Connecting to Nodes Through Secured Shell

When you connect as an Operator to an MGX node through Cisco MGM, or when Cisco MGM connects to MGX, secured shell (SSH) enhances the security.

Note To use SSH through the Cisco MGM client, the SSH secured shell must be installed and the path to the executable must be set in the environmental variable PATH. For more information, refer to the SSH Communications Security Corporation at the following URL: http://www.ssh.com

To connect to a node using SSH:

Step 1 In the Configuration Center, to choose the node in the Hierarchy pane, you can:

a. Choose the node.

b. Enter the node name or IP address into the text box.

Step 2 To use SSH, you can:

a. Right-click the source node and choose **Administration > SSH**.

b. Select the source node and choose **Tools > Administration > SSH**.

Step 3 Enter the default switch username **cisco** into the text box.

Note If you decide not to use ssh by choosing telnet, you do not need to enter a username.

Step 4 Click **OK** to open the SSH secure shell window.

Step 5 At the prompt, enter the password to log on the node through SSH.

5.2.3 Monitoring a Network Element

You can monitor the status of the NEs through Chassis View. Alarm Browser also provides up-to-date information that can be used for managing faults. See Chapter 9, “Managing Faults.”

To monitor an NE:

Step 1 In the Chassis View tree, to choose the NE, you can:

a. Choose the NE.

b. Enter the node name or IP address into the text box.

Step 2 Press **Enter**.

The chosen NE is displayed along with the current status for each card.

Step 3 Click the **Front View** tab or **Rear View** tab of the NE. The default is the front view.

Step 4 Check the status of the NE from Inspector View.

5.2.4 Monitoring a Card with Chassis View

You can select a card to monitor when the objects are associated with a particular card. The following settings are monitored using the objects:

- SONET interface settings
- Interface partition settings
- Revision numbers of hardware, software, and firmware installed on the card
- Lines, interfaces, and ports on the card

To monitor a card:

Step 1 In Chassis View, there are two ways to choose the card:

- Choose the card from the Hierarchy pane, or
- Click the slot that you want to display from the node view. A yellow border highlights the chosen slot in the node view.

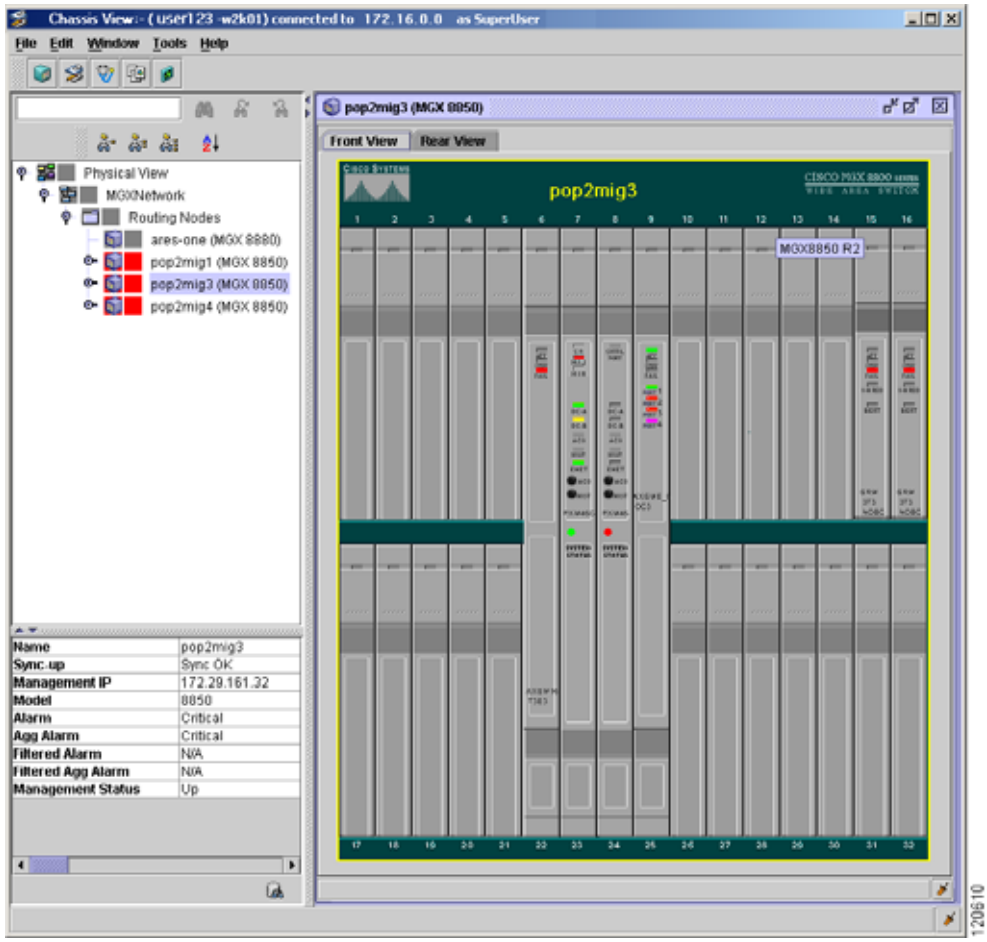
Step 2 Click the **Front View** tab or **Rear View** tab of the node. The default is the front view. See Figure 5-2.

Step 3 Check the status of the card from Inspector View.

Step 4 Right-click the slot and choose the corresponding application. If you want to configure the settings for the card, choose **Configuration Center**.

The Configuration Center is launched with a view of the network elements.

Figure 5-2 Chassis View - Front View



5.2.5 Monitoring a Line or Port with Chassis View

You can select a port if managed objects are associated with a particular port, line, or interface.

To monitor a line or port:

Step 1 In Chassis View, there are two ways to choose the line or port:

- Choose the line or port from the Hierarchy pane, or
- Click the line or port that you want to display from the node view. A yellow border highlights the chosen line or port in the node view.

Step 2 Click the **Front View** tab or **Rear View** tab of the node. The default is the front view.

Check the status of the line or port from Inspector View.

Step 3 Right-click the line or port and choose the corresponding application. If you want configure the settings for the line or port, choose **Configuration Center**.

The Configuration Center is launched with a view of the network elements.

5.2.6 Monitoring Scheduled Tasks

The Job Monitor table provides information about scheduled administrative tasks—memory backup, memory restore, and software download. For example, you can see the system username of the person who entered a specific task, the time that the task began, and the time that the task ended.

Note A job consists of multiple tasks.

Each entry consists of the following:

- Task Owner—User ID used during login.
- NE ID—NE ID on which the operation is executed.
- Task Creation Time—Server time when the request was made.

After these requests are executed, the job's status is updated accordingly in the Job Monitor table.

5.2.6.1 Viewing the Job Monitor Table

To view the Job Monitor table:

Step 1 Choose **Administration > Job Monitor** in the Domain Explorer window. The Job Monitor table appears and displays the fields described in Table 5-8.

Note Some fields in the Job Monitor Table apply only to certain tasks, NEs, or NE versions.

Table 5-8 Job Monitor Table Descriptions

Column Name	Description
Job ID	ID number corresponding to the selected job.
Task ID	ID number corresponding to the task. If a job includes more than one NE, each NE has a separate task ID for the job.
Task Type	Indicates the type of task: • Automatic memory backup • Memory backup • Memory restore • Software download
Task Owner	System username of the person who entered the task.
NE ID	Name of the NE on which the task is scheduled to run.
Task Status	Current status of the task: Queued, Running, Canceled, Failed, Succeeded, or Waiting: • Queued—The task is scheduled but has not yet begun. • Running—The task is in progress. • Canceled—The task has been canceled. • Succeeded—The task succeeded. • Failed—The task failed. • Waiting: The node manager must be initialized before a task can begin. If the node manager is not initialized, the status of the task is Waiting. After the node manager becomes initialized, the task status changes to Queued.
Task Creation Time	Date and time when the task was entered into the system.
Task Scheduled Time	Date and time when the task is scheduled to begin.
Task Start Time	Date and time when the task began.
Task End Time	Date and time when the task ended.
Display Information	Displays information related to the Task Type column.
User Comments	Displays any user-entered comments relating to the task.
Additional Information	Displays any additional information.

5.2.6.2 Viewing the Job Monitor Filter Dialog Box

Use the Job Monitor Filter dialog box to filter job data according to criteria that you select and to display the results in the Job Monitor Table. Table 5-9 provides descriptions:

Table 5-9 Job Monitor Filter Dialog Box Descriptions

Tab	Description
Creation Time (time zone)	Allows you to filter job monitor data for a specified time period, ranging from the past hour to the past 180 days. Additionally, you can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. Click **No Time Specified** if you want to filter events and the time period is not important.
NE ID	Allows you to select network elements (NEs) back and forth between the list of available NE IDs and selected NE IDs. The filter runs on the NEs in the Selected NE ID list.
Task Owner	Allows you to move owners back and forth between the list of available owners and selected owners. The filter runs on the owners in the Selected Task Owner list.
Job/Task ID	Allows you to filter jobs by job and task IDs. Jobs consist of multiple tasks. For example, if you perform a memory backup for multiple NEs, the backup operation is a job, and each NE is a task. • If you specify a start and end ID range in the job ID field but leave the task ID field blank, the filter runs on the job ID range. • If you specify a start and end ID range in the task ID field but leave the job ID field blank, the filter runs on the task ID range. • If you specify a start and end ID range in both the job ID and task ID fields, the filter first applies the values in the job ID field, then narrows the filter according to the values in the task ID field. For example, if you specify that job ID Start = 1, job ID End = 3, task ID Start = 1, and task ID End = 2, the returned value is all entries with a job ID of 1, 2 or 3 and a task ID of 1 or 2.
Task Type	Allows you to move task types back and forth between the list of available task types and selected task types. Task types include: • Automatic memory backup • Memory backup • Memory restore • Software download The filter runs on the tasks in the Selected Task Type list.
Task Status	Allows you to filter tasks by status: • Queued—The task is scheduled but has not yet begun. • Running—The task is in progress. • Canceled—The task has been canceled. • Failed—The task failed. • Succeeded—The task succeeded. • Waiting—The node manager must be initialized before a task can begin. If the node manager is not initialized, the status of the task is Waiting. After the node manager becomes initialized, the task status changes to Queued.

5.2.6.3 Canceling a Scheduled Job or Task

To cancel a scheduled job or task from the Job Monitor table list:

Step 1 In the Domain Explorer window, choose **Administration** > **Job Monitor**.

Step 2 Select a task to cancel; then, click the **Cancel Task** or **Cancel Job** tool (or choose **Edit** > **Cancel Task**, or **Edit** > **Cancel Job**).

Note Cancel is enabled only for jobs and tasks with a Queued status. When a job contains more than one task in a Queued status, choosing **Cancel Job** cancels all tasks with the same job ID.

Step 3 Click **OK** in the confirmation dialog box.

5.2.6.4 Job Monitor Notes

The Job Monitor Note dialog box allows you to view and add notes to jobs displayed in the Job Monitor window. If a job has a note, a Job Monitor Note tool appears under the User Comments column. To view, add, or delete a note, select a job and click the tool. Comments are visible to all users.

The following table provides descriptions:

Table 5-10 Field Descriptions for the Job Monitor Note Dialog Box

Field	Description
Note	Provides space for you to type your comments about the selected job. To add comments to the previous comments, click the **Append** radio button. To overwrite the previous comments, click **Replace**. To delete the comments, click **Delete**.
History	Displays comments entered by previous users.

To edit a Job Monitor user note:

Step 1 In the Domain Explorer window, choose **Administration** > **Job Monitor**.

Step 2 Select a task and choose **Edit** > **User Note**.

You can export the information in the Job Monitor Table to a file (see 5.7.1 Exporting Data to a Text File), or you can generate an HTML file (see 5.7.2 Generating an HTML Report).

5.2.7 Monitoring Service Status

The Service Monitor Table allows you to view the status of the services that are running on the Cisco MGM server. Table 5-11 provides descriptions:

Table 5-11 Column Name Descriptions for the Service Monitor Table

Column Name	Description
Service Name	Displays the name of the selected service.
Logged In At	Displays the last time the user logged in.
IP Address	Displays the IP address of the selected service.
Session ID	Displays the unique session ID.

Note The **showmgm** command is an alternate way of viewing processes or services that are running in the Cisco MGM server.

You can export the information in the Service Monitor Table to a file (see 5.7.1 Exporting Data to a Text File), or you can generate an HTML file (see 5.7.2 Generating an HTML Report).

5.2.8 Searching for a Network Element

Cisco MGM allows you to search for a specific NE in the network. The search always starts from the root node and returns to the root node after reaching the last node.

Step 1 In the Domain Explorer, choose **Edit > Find**.

Step 2 In the Find dialog box, from the Object Type drop-down list, select Network Element/Group.

Step 3 In the Object Properties section, search for an NE using one of the following methods:

- Name—Click this radio button and enter the name of the NE you are searching for.
- IP Address—Click this radio button and enter the IP address of the NE you are searching for.
- Description—Click this radio button and enter a description of the NE that you are searching for.

Step 4 Check the **Ignore Case** check box to make the search noncase-sensitive.

Step 5 Click **OK**. In the Domain Explorer, the NE is highlighted in the tree section and the NE properties are displayed in the properties section.

Note In the Domain Explorer, you can also choose **Edit > Find Next** to find the next object that matches the initial Find specification.

5.2.9 Monitoring Cisco MGM Client/Server Configuration Details

The Cisco MGM Properties pane displays information about the Cisco MGM server and client configuration. In the Control Panel, choose Cisco MGM from the Hierarchy pane to display the Cisco MGM Properties pane. This pane has two tabs; Server Configuration and Client Configuration. Table 5-12 provides descriptions:

Table 5-12 Cisco MGM Properties Descriptions

Tab	Field	Description
Server Configuration	Server Name	Displays the workstation name where the Cisco MGM server application resides.
	IP Address	Displays the IP address of the Cisco MGM server.
	Server Port	Displays TCP port number of the Cisco MGM server.
	Software Version	Shows the Cisco MGM software version that is running.
Client Configuration	Host Name	Displays the workstation name where the Cisco MGM client application resides.
	IP Address	Displays the IP address of the Cisco MGM client.
	Version	Shows the Cisco MGM software version that is running.
	Username	Displays the name that was used to log into the Cisco MGM client.

Note The Server and Client configuration details cannot be edited.

5.2.10 Monitoring Network Manageability Statistics

These tasks are used in the Diagnostic Center to monitor statistics events for network manageability:

- 5.2.10.1 Running a Diagnostic Check at the Network Level
- 5.2.10.2 Running a Diagnostic Check at the Node Level
- 5.2.10.3 Statistics Entries for Network Manageability
- 5.2.10.4 Sending a Trouble Ticket

By monitoring network manageability, you can:

- Collect element management health-related statistics.
- Browse over detailed information about past element management health statistics.
- Provide statistics about the success rates, failure rates, and throughput of Cisco MGM to network interfacing protocols, such as FTP, and SNMP.
- Report the number of successes and failures that happened in the last hour.
- Retrieve statistics for a given time period.
- Identify problems with Cisco MGM and the ability to effectively manage the network.
- Identify the root causes for problems that can occur due to general network problems.
- Display information about all the nodes at the network level.
- Display information at the node level.

5.2.10.1 Running a Diagnostic Check at the Network Level

In the Diagnostic Center, you can verify that all the nodes in the network are being managed correctly by Cisco MGM.

To run a diagnostic check at the network level:

Step 1 In the Diagnostic Center, double-click or drag and drop the network from the Hierarchy pane to the right hand pane, to display the diagnostics at the network level.

Step 2 Click the **Manageability** tab. See Figure 5-3.

Step 3 In the **From Period** area:

a. Choose the date to start from the **Date** drop-down arrow.

b. Choose the time from the **Time** drop-down arrow.

The default time is 12:00 a.m (0000).

Step 4 In the **To Period** area:

a. Choose the date to end from the **Date** drop-down arrow.

The maximum number of days to keep data is 30 days. The minimum number of days is 1.

b. Choose the time from the **Time** drop-down arrow.

The default time is 12:00 a.m (0000).

Step 5 Click **Refresh** to refresh the health data for the network.

Step 6 Verify the statistics values for each node ID and node name from the **Protocols Statistics** area.

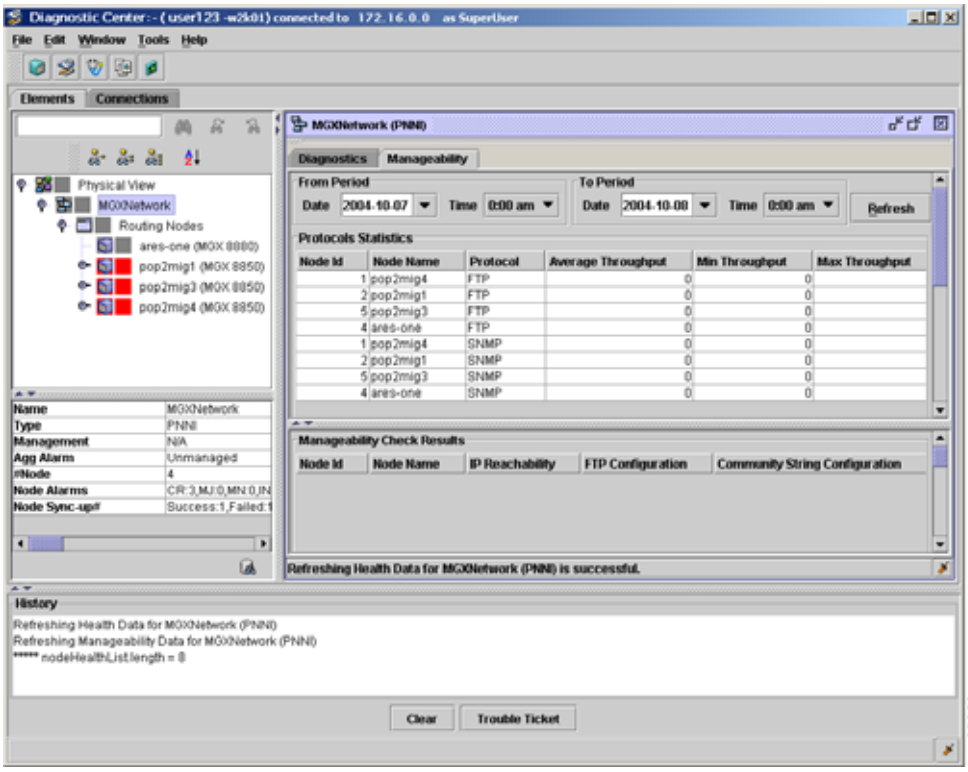
For parameter definitions, see Table 5-13.

Step 7 Verify the manageability data results for the node from the **Manageability Check Results** area.

For parameter definitions, see Table 5-14.

Step 8 Click **Refresh** to retrieve all check result entries in the manageability table for every node in the network.

Figure 5-3 Diagnostic Center—Manageability Tab



5.2.10.2 Running a Diagnostic Check at the Node Level

In the Diagnostic Center, you can verify that selected nodes are being managed correctly by Cisco MGM.

To run a diagnostic check at the node level:

Step 1 In the Diagnostic Center, double-click or drag and drop the node from the Hierarchy pane to the right hand pane, to display the diagnostics at the node level.

Step 2 Click the **Manageability** tab. See Figure 5-3.

Step 3 In the **From Period** area:

a. Choose the date to start from the **Date** drop-down arrow.

b. Choose the time from the **Time** drop-down arrow.

The default time is 12:00 a.m (0000).

Step 4 In the **To Period** area:

a. Choose the date to end from the **Date** drop-down arrow.

The maximum number of days to keep data is 30 days. The minimum number of days is 1.

b. Choose the time from the **Time** drop-down arrow.

The default time is 12:00 a.m (0000).

Step 5 Click **Refresh** to retrieve all statistics entries for the node.

For parameter definitions, see Table 5-13.

Step 6 In the **Node Login Information** area:

a. Enter the user name in the **User Id** field.

b. Enter password in the **Password** field.

Step 7 Click **Check Manageability** to run a diagnostic check for the node.

Step 8 Verify the check results from the **Manageability Check Results** area.

For parameter definitions, see Table 5-14.

5.2.10.3 Statistics Entries for Network Manageability

The statistics entries that are used for network manageability are described in Table 5-13 and Table 5-14.

Table 5-13 lists the parameters for the protocol statistics that are health-related.

Table 5-13 Health Related Parameters

Name	Description
Node Id	Identifies the ID for the configured node.
Node Name	Identifies the configured name of the node.
Protocol	Specifies the protocol for either FTP or SNMP.
Average Throughput	Measures the average FTP throughput performance in bytes per second for the switch during the specified time period. The average SNMP throughput is measured in seconds per request for the switch during the specified time period.
Min Throughput	Measures the minimum throughput performance for FTP, and SNMP on a per node basis. The minimum throughput is calculated for FTP, and SNMP operations.
Max Throughput	Measures the maximum throughput performance for FTP, and SNMP on a per node basis. The maximum throughput is calculated for FTP, and SNMP operations. The value is the maximum rate achieved in bytes per second for any one FTP request to complete.
Success	Specifies the number of successful FTP, or SNMP operations for the node during the specifies time period.
Session Failure	Specifies the number of network failures for the session.
Transfer Failure	Specifies the number of network failures for the transfer.
Retry Exceeded	Provides information about the number of times for retries that exceeded the maximum set limit.
File Size Mismatch	Specifies that the file transfer is considered a success if the local file size matches with the remote file size. For a mismatch, an error is reported.
Throttle Error	Determines the maximum limit for the number of pending Get, Set, and GetNext operations reached for the switch.
Session Timeout	Specifies the session timeout period where the FTP request remains in the request queue.

Table 5-13 Health Related Parameters (continued)

Name	Description
Transfer Timeout	Specifies the transfer timeout is the estimated period when the transfer is completed. The transfer is done by FTP from the previous transfer of the throughput data for a node. If the file transfer fails to complete within the period, transfer is aborted and an error is reported.
Queue Full	Accommodates a finite number of concurrent TFTP requests and if the queue is fully any new request can trigger a report error.
Generic Error	Displays any generic error returned by the node.

Table 5-14 lists the check results parameters for network manageability.

Table 5-14 Network Manageability Parameters

Name	Description
Node Id	Identifies the ID for the configured node.
Node Name	Identifies the configured name of the node.
IP Reachability	Specifies the results of the IP reachability test.
FTP Configuration	Specifies the results of the FTP reachability test.
Community String Configuration	Specifies the results of the SNMP community string.
Trap IP Configuration	Specifies the results of the trap IP configuration test.
Trap Manager Configuration	Verifies if the Cisco MGM workstation is registered as a trap manager.
Time Stamp	Specifies the time stamp when the manageability check was requested.

5.2.10.4 Sending a Trouble Ticket

The Diagnostic Center collects the output and results of all the diagnostic operations and logs them into the History Panel. You can send a trouble ticket that includes all the data from the History Panel.

To send a trouble ticket:

Step 1 In the Diagnostic Center, drag and drop the network or node from the Hierarchy pane to the right hand pane, to display the diagnostics at either the network level or the node level.

Step 2 Click the **Manageability** tab to display the Manageability Configuration window at the node level.

Step 3 Click **Trouble Ticket** to display the Trouble Ticket window.

Automatically, the entire content from the History Panel is extracted into the Trouble Ticket window.

Step 4 Enter the email address that you want to send the trouble ticket to in the **To** field.

Step 5 Enter the title of the trouble ticket in the Subject field.

Step 6 Click **Attach** to include an Element or Connection file with the trouble ticket, if required.

Step 7 Click **Send** to send the trouble ticket to recipient.

Step 8 Click **Save** to save the trouble ticket in the directory.

5.2.11 Managing the VSI Controllers

These tasks are used to work with VSI controllers:

- 5.2.11.1 Creating a VSI Controller
- 5.2.11.2 Displaying a VSI Controller
- 5.2.11.3 Deleting a VSI Controller

5.2.11.1 Creating a VSI Controller

A VSI controller must be added when a new node is added. There is one controller per node.

To create a VSI controller, complete the following procedure:

Step 1 In the Domain Explorer, right-click the node from the Hierarchy pane and choose **Configuration > MGX8880/8850 MG > Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Controllers** tab to display the Controllers Table.

Step 4 Click **Create** to display the Controllers Create window.

Step 5 Enter the ID for the VSI controller in the **Controller ID** field.

Step 6 Choose one of the following controller options from the **Controller Type** drop-down arrow:

- **par**—Portable Auto Route (PAR). The **par** option is a VSI Master controller that implements a Cisco proprietary protocol for network routing and topology in a network, which contains only Cisco switches.
- **pnni**—Private Network-to-Network Interface (PNNI) controller. The PNNI protocol is used between private ATM Switches and between groups of ATM switches. PNNI is defined for distributing topology information between switches and clusters of switches.
- **lsc**—Label Switch Controller (LSC). The LSC implements the MPLS protocol. The LSC is a router which is capable of controlling the operation of a separate ATM switch, so that both of them function as a single ATM-LSR (ATM Label Switch Router).

Step 7 Enter the name for the controller in the **Controller Name** field.

Step 8 Choose one of the following shelf location options from the **Controller Shelf Location** drop-down arrow:

- **internal**—specifies that the controller resides on the same shelf as the switch.
- **external**—specifies that the controller resides on the external platform. The controller shelf is connected to the switch by an ATM link.

Step 9 Enter the slot number that the VSI controller is plugged into in the **Controller Location** field.

Step 10 Click **Apply** to create a VSI controller.

5.2.11.2 Displaying a VSI Controller

To display a VSI controller, complete the following procedure:

Step 1 In the Domain Explorer, right-click the node from the Hierarchy pane and choose **Configuration > MGX8880/8850 MG > Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Controllers** tab to display the Controllers Table.

Step 4 Select the controller entry from the Controllers Table.

Step 5 Click **Details** to display the Controllers Configuration window.

5.2.11.3 Deleting a VSI Controller

To delete a VSI controller, complete the following procedure:

Step 1 In the Domain Explorer, right-click the node from the Hierarchy pane and choose **Configuration > MGX8880/8850 MG > Configuration Center**.

Step 2 Click the **Elements** tab to display the Configuration Window for Elements.

Step 3 Click the **Controllers** tab to display the Controllers Table.

Step 4 Select the controller entry from the Controllers Table.

Step 5 Click **Delete** to delete the controller entry.

5.3 How Do I Modify the Network?

This section contains the following information:

- 5.3.1 Changing the Operational State of an NE
- 5.3.2 Backing Up and Restoring Memory
- 5.3.3 Changing IP Addresses for NEs
- 5.3.4 Viewing and Modifying the Server Configuration
- 5.3.5 Setting Up Session Recovery
- 5.3.6 Changing the Server IP Address when Cisco MGM and Oracle Are on the Same Server
- 5.3.7 Viewing and Modifying Server Configuration Information
- 5.3.8 Restoring Server Configuration Files
- 5.3.9 Initializing the Node Resync Process
- 5.3.10 Configuring Application-Specific Parameters
- 5.3.11 Using UNIX-Level Scripts

5.3.1 Changing the Operational State of an NE

You need to change the operational state of a NE to carry out certain tasks. For example, the operational state field of an NE must be changed to Out of Service before the NE can be deleted.

To change the operational state of an NE:

Step 1 In the Domain Explorer tree, select the NE that will be changed. The Network Element Properties pane appears.

Step 2 In the Operational State field, choose one of the following operational states:

- In Service—The NE is deployed and requires monitoring. Cisco MGM collects polling, fault management (FM), configuration management (CM), and PM data from in-service NEs and stores the data in the database.
- Out of Service—The NE has been marked Out of Service by a network administrator and does not require monitoring. The Cisco MGM database records the last known state of the NE when it was In Service.
- Under Maintenance—The NE is temporarily Under Maintenance but requires monitoring. This state is the same as In Service except that Cisco MGM does not report alarms or events for Under Maintenance NEs.

Tip You can also right-click an NE in the Domain Explorer tree and choose **Mark Under Maintenance, Mark In Service,** or **Mark Out of Service** from the shortcut menu.

Two additional operational states cannot be chosen by the user. These operational states are changed by Cisco MGM based on the initialization tasks that are completed:

- In Service–Initializing—The NE is marked as In Service–Initializing when Cisco MGM reaches connectivity of the NE (Communication State is marked as Available) and the discovery process starts. The initialization process is completed when fault and inventory have been synchronized. The operational state changes from In Service–Initializing to In Service–Synch Configuration.
- In Service–Synch Configuration—The NE is marked as In Service–Synch Configuration when Cisco MGM uploads a configuration for that NE. You can change the operational state of an NE from In Service–Synch Configuration to Out of Service.

Step 3 Click **Save**.

Timesaver If an NE is brought down, mark it as Out of Service to prevent unnecessary polling traffic on the data communications network (DCN).

Note When you mark an NE as Out of Service and then mark it as In Service, the Cisco MGM alarm time stamp in the Alarm Browser window is resynchronized with the time stamp when the NE is put back In Service.

5.3.2 Backing Up and Restoring Memory

Cisco MGM allows you to backup and restore memory for selected NEs. For example, if you wanted to save your settings for a particular NE, you can backup the memory for just that NE.

Cisco MGM backs up configuration and provisioning information residing in the flash memory of an NE.Cisco MGM provides three methods by which to perform the configuration backup operation:

- Manually on demand
- Scheduling (one time only)
- Periodic, automatic scheduling based on a configurable time set by the operator

The operator can specify the number of backup configurations that should be kept at any given time. The default number is seven.

Note The maximum number of copies that can be saved is fundamentally dictated by the amount of disk space available.

The oldest configuration that was backed up is replaced by the current backup depending on the (configured) number of copies the user wishes to retain at any given time. The memory restore function in Cisco MGM can then be used to rollback to any one of the previous configurations that was saved. Once the configuration is downloaded, the operator will need to issue CLI commands to activate the new configuration.

Note This restore operation would be service affecting as the node will be re-booted to reflect the restored configuration.

Follow the procedures described in these sections to backup and restore memory (configuration data) on NEs within the following products:

- MGX8880
- MGX8850

5.3.2.1 Backing Up Memory

Note Table 5-15 describes the fields in the Memory Backup dialog box.

Step 1 In the Domain Explorer tree, select a management domain or group that contains NEs that are assigned an In Service or Under Maintenance operational state. Alternatively, select an NE that is assigned an In Service or Under Maintenance state.

Note Memory backup is not allowed for out-of-service NEs.

Step 2 Choose **Administration > Memory Backup**.

Step 3 The Memory Backup dialog box appears. Enter the following information (see Table 5-15 for details):

- NE Model

- Available NEs
- (Optional) Job Comments
- Tag Name
- Time (time zone)

Note The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

Click **Finish** to initiate the memory backup procedure.

The configuration file is copied to the /opt/CiscoMGMServer/admin/*nodename*/MGX-*timestamp*-bkp.cfg file.

Note If User Specified is chosen and **hello** is entered for the tag name, the filename is MGX-hello-YYYYMMDDHHMM-backup.cfg where YYYYMMDDHHMM is the backup date, consisting of:

YYYY—Four-digit year
MM—Two-digit month
DD—Two-digit day
HH—Two-digit hour (in 24-hour format)
MM—Two-digit minute

The length of a filename including a user specified name should not exceed 40 characters. If a long filename is chosen, it will be truncated to 15 characters.

After scheduling the backup, look at the Job Monitor Table (**Administration > Job Monitor**) to see the job status. If the job fails, the Additional Information field in the Job Monitor Table provides extra information.

If a memory backup job fails, it raises an EMS alarm. All prior memory backup failure EMS alarms on an NE are cleared under the following conditions:

- After a successful memory backup operation on the NE
- When the operational state of the NE changes to Out of Service

Table 5-15 Memory Backup Dialog Box Descriptions

Field	Description
NE Model	Select the NE type that you want to back up. The type you select determines the NEs that are displayed in the Network Elements area.
Available NEs	Use the **Add** and **Remove** buttons to move the NEs that you want to back up to the Selected NEs list, or to remove NEs from the list.
Job Comments (Optional)	Enter comments about the backup, if needed.

Table 5-15 Memory Backup Dialog Box Descriptions (continued)

Field	Description
Tag Name	Add a tag to the system-generated filename. If you select System Default, no tag name is added. If you select User Specified, you can enter a tag name. The length of a filename including a user specified name should not exceed 40 characters. If a long filename is chosen, it will be truncated to 15 characters.
Time (time zone)	Set a time for the backup. Click **Now** to begin backup immediately, or click **At Time** and specify when to begin backup, in 5-minute increments. **Note** The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

5.3.2.2 Restoring Memory

Note Table 5-16 describes the fields in the Memory Restore dialog box.

Use the Memory Restore dialog box to restore provisioning and configuration information stored in the flash memory of an NE. (This information is backed up by using the Memory Backup dialog box.)

Step 1 In the Domain Explorer tree, select an MGX8880, or an MGX 8850 NE that is assigned an In Service or Under Maintenance operational state.

Note Run the Memory Restore procedure *one* NE at a time.

Step 2 With the NE selected, choose **Administration > Memory Restore**.

Step 3 The Memory Restore dialog box appears. Enter the following information (see Table 5-16 for more details):

- NE Model
- Network Elements (select only one)
- (Optional) Job Comments
- Source
- Time (time zone)

Step 4 Click **Finish** to initiate the memory restore procedure.

To view the results of the memory restore operation, open the Job Monitor Table. For information about the Job Monitor Table, see section 5.2.6 Monitoring Scheduled Tasks, page 5-23.

Table 5-16 Memory Restore Dialog Box Descriptions

Field	Description
NE Model	Select the NE model that you want to restore. The model you select determines the NEs that are displayed in the Network Elements field.
Network Elements	Use the **Add** and **Remove** buttons to move the NE that you want to restore to the Selected NE list. You can run the Memory Restore procedure for only one NE at a time.
Job Comments (Optional)	Enter comments about the restore procedure, if needed.
Source	Specify the location of the backup file that you want to use to restore the NE: • Click **Local** to browse a local client directory for the backup file. • Click **Server** to restore the file from the Cisco MGM server. The files shown are in the directory /opt/CiscoMGMServer/admin/*nodename*. **Note** The Server radio button is not active unless a file exists in that directory. • **Remote** option is grayed out
Time (time zone)	Set a time for memory restore. Click **Now** to begin memory restore immediately, or click **At Time** and specify when to begin memory restore, in 5-minute increments. **Note** The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

5.3.3 Changing IP Addresses for NEs

In Cisco MGM, the IP address field for an NE is read-only, and cannot be modified. If a user changes the IP address on the MGX switch, Cisco MGM receives traps and updates the IP address on the clients and in the database.

5.3.4 Viewing and Modifying the Server Configuration

The Control Panel window shows the Cisco MGM client and server configuration and allows modification of the configuration. Certain modifications take effect immediately and change the active server configuration. Other changes take effect when the server is restarted.

The different property sheets within the Control Panel window allow you to start or stop performance monitoring services and NE services by NE type. Also use the Control Panel to start or stop Cisco MGM GateWay/CORBA services. Only Cisco MGM users who are logged in as SuperUser or SysAdmin can access the Control Panel. In the Domain Explorer, choose **Administration > Control Panel** to view the Control Panel.

The following are listed in the Control Panel:

- UI Properties—Configure application-specific parameters.
- Security Properties—Configure Cisco MGM security parameters and specify usernames and passwords for all the NEs.

- Recovery Properties—View a list of servers that clients will log into if access to the primary server is disrupted and view a list of critical services that the server monitors.
- Database Properties—View database configuration, pruning time periods, and information that the server uses to log into the Oracle database.
- Alarm Configuration Properties—View threshold and non-threshold parameters.
- Error Log Properties—View configuration parameters about error information that the server records.
- NE Service—Select an NE type and view and update server configuration, which includes port information, timing parameters, maximum number of administrative tasks, and NE backup parameters.
- PM Service—Select an NE type and view and modify PM Configuration settings and PM Collection Parameters for the particular NE.
- GateWay/CORBA Service—Stop, start, or configure parameters for the GateWay/CORBA service.

Note The NE Service and GateWay/CORBA services can take up to 60 seconds to initialize after the GUI status has changed to indicate that the service is up. The status is an indication of the successful initiation of the service startup, not successful initialization.

5.3.5 Setting Up Session Recovery

Administrators can list the servers that clients will log into if access to the primary server is disrupted. To set up session recovery:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 Click **Recovery Properties** to open the Recovery Properties sheet.

Step 3 Click the Session Recovery tab. Table 5-17 describes the fields within the Session Recovery tab.

Step 4 In the Session Recovery area, specify the following:

- Wait Time—Enter the number of seconds that the client waits before attempting to log into a backup server.
- No. of Retries—If the first backup server is not available, enter the number of times that the client should retry logging back before connecting to the next server on the list.

Step 5 In the Server List area is a list of servers that client will log into if access to the primary server is disrupted. Click **Add** if you want to add a server to the list. Click **Remove** if you want to remove a server from the list.

Note If access to the primary server is disrupted, the client tries to log back into the primary server by default. If the client cannot log back into the primary server, and if the server list contains server names, the client tries to log into each backup server in the order listed until the last server in the list is reached, or until the client successfully logs into a server.

Table 5-17 Recovery Properties—Session Recovery Tab

Field	Description
Wait Time	If disruption to the primary Cisco MGM server occurs, the Wait Time field provides the number of seconds the client waits before attempting to log into the backup server.
No. of Retries	If the first backup Cisco MGM server is not available, this field provides the number of times the client should retry logging in before moving to the next server on the list.
Server List	Lists the Cisco MGM servers that Cisco MGM clients will log into if access to the primary Cisco MGM server is disrupted. The Add button adds a Cisco MGM server to the Cisco MGM server list. The Remove button removes a Cisco MGM server from the list. If access to the primary Cisco MGM server is disrupted, the Cisco MGM client tries to log back into the primary server by default. If the Cisco MGM client cannot log back into the primary server, and if the server list contains server names, the client tries to log into each backup server in the order listed until the last server in the list is reached, or until the client successfully logs into a server.

5.3.6 Changing the Server IP Address when Cisco MGM and Oracle Are on the Same Server

Note You will need to update the configuration files after changing the server IP address, see 5.3.6.1 Updating the Configuration Files after Changing the Cisco MGM Server IP Address.

To change the IP address of a standalone Cisco MGM server with a single IP interface when Cisco MGM and Oracle are on the same server:

Step 1 Log into the Cisco MGM server as the root user.

Step 2 Enter the following command to shut down the Cisco MGM server:

```
mgms-stop
```

Step 3 Enter the following commands to shut down Oracle:

```
su - oracle
sqlplus ctmanager/mgm123!
SQL> connect sys/change_on_install as sysdba
SQL> shutdown immediate;
SQL>exit
```

Step 4 Complete the following:

a. Enter the following command to change the IP address in the /etc/netmasks file:

```
#vi /etc/netmasks
```

b. Enter the following command to change the IP address in the /etc/hosts file:

```
# vi /etc/hosts
```

c. Enter the following command to change the IP address in the etc/hostname.*xxx* file, where *xxx* is the IP interface that is defined in the Solaris server:

```
# vi /etc/hostname.xxx
```

d. Enter the following command to change the default router file, if required:

```
# vi /etc/defaultrouter
```

e. Enter the following command to change the subnet mask on the Cisco MGM server:

```
# vi /etc/netmasks
```

Step 5 Complete the following application-level steps:

a. Enter the following command to change the IP address in the Oracle listener file:

```
# vi /oraclesw9i/producl/9.2/network/admin/listener.ora
```

b. Enter the following command to change the IP address in the Oracle tnsnames file:

```
# vi /oraclesw9i/producl/9.2/network/admin/tnsnames.ora
```

c. Enter the following command to change the IP address in the Cisco MGM server configuration file:

```
# vi /opt/CiscoMGMServer/cfg/CTMServer.cfg
```

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Note Make sure to change all IP addresses where they are referenced.

Step 6 Enter the following commands to halt and reboot the Cisco MGM server:

```
# sync:sync;halt
OK boot -r
```

5.3.6.1 Updating the Configuration Files after Changing the Cisco MGM Server IP Address

If you change the Cisco MGM server IP address (as shown in section 5.3.6 Changing the Server IP Address when Cisco MGM and Oracle Are on the Same Server, page 5-41) you must replace the old IP address with the new IP address in the configuration files shown in Table 5-18. Use a standard UNIX text editor such as vi to update the files. Changes in the configuration files take effect after rebooting the server.

Table 5-18 Configuration Files that Require Updating

Filename	Location
UNIX Configuration Files	
hosts	/etc
netmasks	/etc
defaultrouter	/etc

Table 5-18 Configuration Files that Require Updating (continued)

Filename	Location
Oracle Configuration Files	
tnsnames.ora	/oraclesw9i/product/9.2/network/admin
listener.ora	/oraclesw9i/product/9.2/network/admin
Cisco MGM Server Configuration File	
MGMServer.cfg	/opt/CiscoMGMServer/cfg

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

5.3.7 Viewing and Modifying Server Configuration Information

The NE Service Properties pane allows you to view and update Cisco MGM server configuration information, which includes port information, timing parameters, and network element (NE) backup parameters. All server configuration changes take effect when you save them, with the exception of changes to the Cisco MGM server port. Port information changes require that you restart the Cisco MGM server before the change takes effect. The NE Service Properties pane has three tabs:

- NE AutoBackup—Allows you to configure automatic NE backup parameters (See 5.1.3.9 Configuring Automatic NE Backup Parameters)
- NE Manual Backup—Allows you to configure manual NE backup parameters (See 5.1.3.8 Configuring Manual NE Backup Parameters)

5.3.8 Restoring Server Configuration Files

To restore the server configuration files:

Step 1 Log into the server workstation as the root user.

Step 2 On the command line, enter the following:

```
cd/opt/CiscoMGMServer/bin
/.restore_config.sh <backup file doc> <log dir> <ISHA>
```

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Note If the server is an HA server, the ISHA value is 1. If the server is not an HA server, the ISHA value is 0.

Table 5-19 Field Description for the NE Service Properties

Field	Description
Service Status	Displays the current status of the service: Active or Not Active.
Service Control	Allows you to stop or start a process. Notice that the Service Control button toggles between Activate and Deactivate, and that the Service Status field changes accordingly.
Error Level	Allows you to choose the error level for alarms on the selected NE to include in the Error Log (Critical, Major, Minor, Informational, Debug, or Trace). Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file. **Caution** Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer.
Threshold	Displays the number of NEs that will be serviced by one instance of the NE service.

5.3.9 Initializing the Node Resync Process

To initialize the node resync process for a node, complete the following procedure:

Step 1 In the Diagnostic Center, from the Hierarchy pane:

- Double-click or drag the network to the right-hand pane to display the diagnostics at the node level and select a node.
- Double-click or drag the node to the right-hand pane to display the diagnostics at the node level.

By default, the **Diagnostics** tab is selected. The Node Diagnostics window is displayed.

Step 2 Choose **Level 1** or **Level 2** options from the Node Resync pane:

- **Level 1**—Resolves inconsistencies between the switch and equipment manager as well as between equipment manager and segment tables.
- **Level 2**—Retrieves the full connection file from the switch and resolves inconsistencies between the equipment manager and equipment manager caches as well as between equipment caches and databroker caches. It also resolves inconsistencies between equipment manager and segment tables. This option is automatically used if the number of inconsistencies is large.

Step 3 Click **Resync** to begin the node resync process.

Step 4 Verify the results of the node resync process from the **Node Resync Result** area.

5.3.10 Configuring Application-Specific Parameters

Note Table 5-20 describes the fields in the User Interface Properties pane.

The User Interface (UI) Properties pane allows you to configure application-specific parameters. Specifically, you can do the following:

- Fault Management—Specify automatic or manual alarm acknowledgement, overwrite alarm notes, and un-acknowledge alarms (for more details, see Chapter 9, "Managing Faults".)
- Domain Management—Specify how long node names are truncated within Network Maps (for more details, see Chapter 4, "Building the Network".)

From the Domain Manager, choose **Administration > Control Panel**. In the Control Panel window, click **UI Properties** to open the User Interface Properties pane.

Table 5-20 User Interface Properties Field Descriptions

Field	Description
Fault Management	• Alarm Acknowledgement—Allows you to specify automatic or manual alarm acknowledgement in the Alarm Browser window. If you choose manual alarm acknowledgment, you must manually acknowledge alarms. Cleared alarms move from the Alarm Browser to the Alarm Log. If you choose automatic alarm acknowledgment, the Cisco MGM server automatically acknowledges alarms when they are cleared and moves them from the Alarm Browser to the Alarm Log. Before alarms move to the Alarm Log, they must be both cleared *and* acknowledged. **Note** You can still manually acknowledge alarms in automatic acknowledgement mode. • Overwrite Alarm Notes—Enables or disables the ability to overwrite alarm notes created by another user. • Alarm Un-Acknowledgement—Enables or disables the ability to unacknowledge alarms that have been acknowledged.
Domain Management	Allows you to specify how node names longer than 25 characters are truncated in the Network Map. If a string is longer than 25 characters, the first 22 characters display followed by an ellipsis (...).You can choose to truncate the first or last characters of the node name.

5.3.11 Using UNIX-Level Scripts

The following UNIX shell scripts are provided to perform administrative functions from the command line on the Cisco MGM server:

- mgms-start
- mgms-abort
- mgms-stop
- mgms-stop-service
- showmgm

- getinfo.sh
- prune_auditlog.sh
- prune_errlog.sh
- prune_audittrail.sh
- prune_fm.sh
- prune_pm.sh
- prune_ne.sh
- prune_server_monitor.sh

These scripts should normally be run as root. However, Cisco MGM facilitates running these scripts as non-root users using sudo. During the Cisco MGM server installation, the setup program prompts you to specify the name of the UNIX group to which you want to assign administrator privileges. By default, this group is set to root. If you specify a group other than root, the setup program verifies that the UNIX group exists on the system and adds entries to the /etc/sudoers file for each of the commands listed above. As such a UNIX user who is a member of the specific group can run the commands using sudo. Sudo is bundled with Cisco MGM and is located in /opt/CiscoMGMServer/admin/sudo/. In order to use the sudo bundled with Cisco MGM the following command should first be run.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Further details about the use and configuration of sudo are provided in the Cisco MGM Installation Guide.

5.4 How Do I Manage the Network Software?

Cisco MGM provides a mechanism to download software image from the Cisco MGM server onto the MGX8880 switch. When the software download is scheduled, an FTP connection is opened to the switch using the IP address, User ID and password. The software image is downloaded to the FW directory. The FTP connection is closed and Cisco MGX processes resume.

Note There is no support for downloading images from an external TFTP server. Software images can be downloaded only if they are locally present on the Cisco MGM server.

When the software image is downloaded, you can use the following commands at the CLI:

- **dsprev** to display the image on the switch
- **loadrev** to load the image on the switch
- **setrev** to set the image on the switch
- **runrev** command to activate the image on the switch.

Follow the procedures described in this section to download new or modified images to NEs:

- 5.4.1 Downloading Software Images

5.4.1 Downloading Software Images

Note Table 5-21 describes the fields in the Download Software Dialog.

Note If a software download has a status of Queued, and if it has a task in the running list, the download cannot be canceled.

Caution If you mark an NE as an Out of Service while a software download is in progress on that NE, the software download might not complete successfully.

To download software images to NEs, Cisco recommends that DCN bandwidth be 56 kbps or higher. If DCN bandwidth is less than 56 kbps, software download might take an extended period of time. Performing software downloads in parallel increases the length of time by a multiple of the number of NEs targeted.

Step 1 In the Domain Explorer tree, select a management domain or group that contains NEs that are assigned an In Service or Under Maintenance operational state. Alternatively, select an NE that is assigned an In Service or Under Maintenance state.

Note Only one software download can occur on a specific NE at any given time.

Step 2 Choose **Administration > Software Download**. The Software Download dialog box appears. See Figure 5-4.

Step 3 Enter the following information:

- NE Model
- Network Elements
- Job Comments
- Source
- Time

Caution If the Cisco MGM client and server run on the same machine and thus the Local source directory is the same as the default destination directory, an error message is generated. To retrieve the software image selected from the Local source directory, navigate to the appropriate path and restore it from the <*software image name*>.*old* file.

Step 4 Click **Finish** to initiate the software download to the standby memory on the NE.

Step 5 Cisco MGM stores two software versions: active and standby. When you download software, it is saved as the standby version.

Figure 5-4 Software Download Window

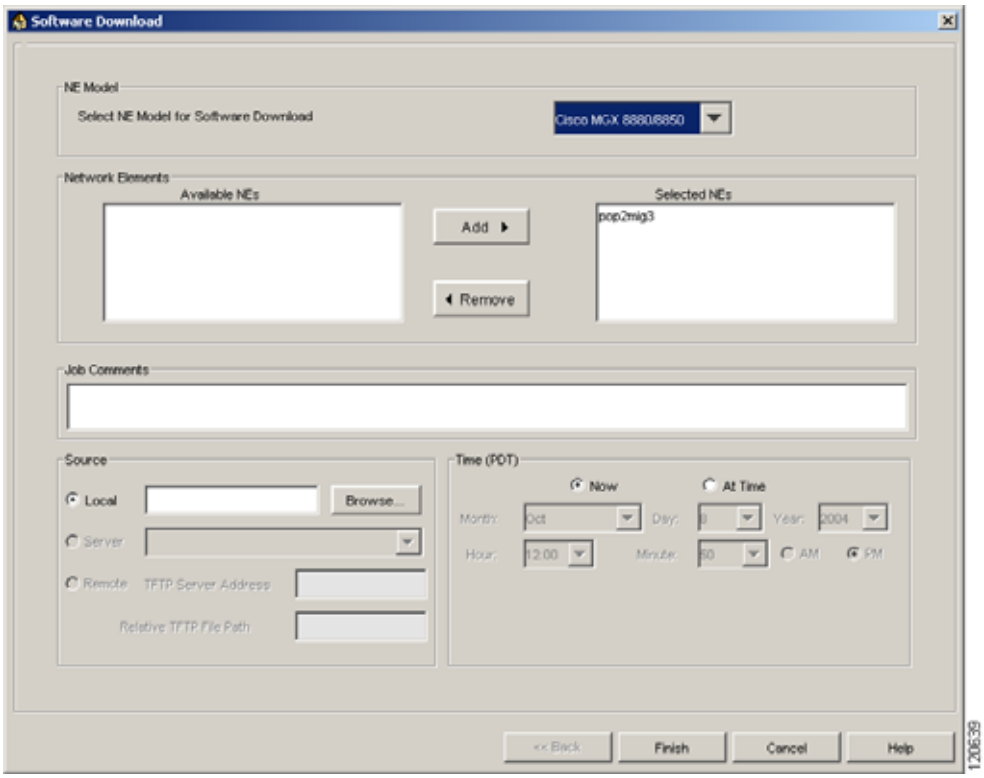


Table 5-21 Field Description for the Software Download Dialog

Field	Description
NE Model	Select the NE type to which you want to download software. The type you select determines the NEs that are displayed under Network Elements.
Network Elements	Use the **Add** and **Remove** buttons to move NEs to the Selected NEs list or remove NEs from the list. Software will be downloaded to NEs in the Selected NEs list.
Job Comments	Enter comments about the software download (optional).

Table 5-21 Field Description for the Software Download Dialog (continued)

Field	Description
Source	Specify the location of the software: • **Local** allows you to select an image on the current client system. • **Server** allows you to select an image on the Cisco MGM server to which your client is connected. • **Remote** option is grayed out.
Time (time zone)	Set a time for the download. Click **Now** to begin download immediately, or click **At Time** and specify when to begin download, in 5-minute increments. **Note** The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

5.5 How Do I Manage Redundancy and Failover?

This section contains the following information:

- 5.5.1 Configuring Card Redundancy

5.5.1 Configuring Card Redundancy

These tasks are used to configure card redundancy:

- 5.5.1.1 Adding Redundancy
- 5.5.1.2 Modifying a Card for Redundancy

Card redundancy uses a secondary card of the same type to serve as a standby card and takes over if the active card fails Automatic protection switching (APS) on a SONET line can be combined with front card redundancy. The ATM link is protected from both line and card failures.

You can setup card redundancy at the shelf level.

5.5.1.1 Adding Redundancy

By adding redundancy, you can link two slots to support card-level redundancy for a pair of service modules. A redundant pair consists of a primary slot and a secondary slot. Both cards must be in the active state for you to configure redundancy. After configuration, the secondary service module goes into the standby state.

To add redundancy:

Step 1 In the Domain Manager, select the node and choose **Configuration > MGX880/8850 MG > Configuration Center** to display the Configuration Window for Elements.

Step 2 Click the **Cards** tab to display a summary report of all the cards that are installed on the node.

Step 3 Choose **Redundancy Info** from the **Category** drop-down arrow to display the redundancy status for the node.

Step 4 Click **Create** to display the Redundancy Configuration window. See Figure 5-5.

Step 5 Enter the slot number of the Primary module in the redundant configuration in the **Primary Slot Num** field.

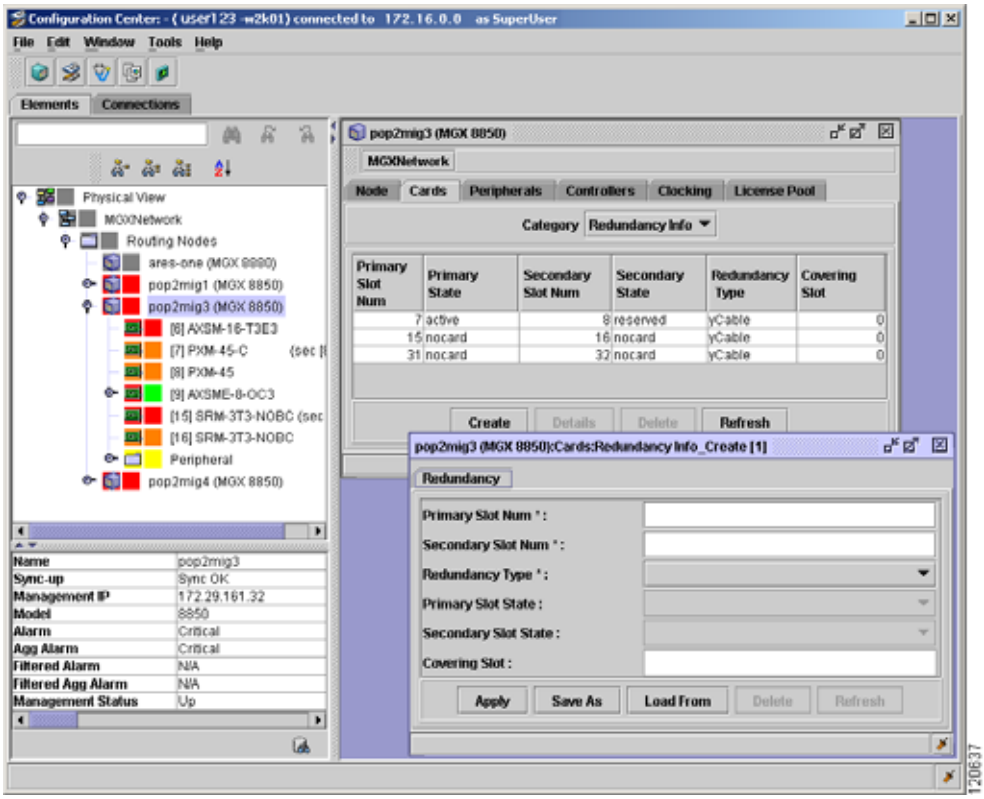
Step 6 Enter the slot number of the Secondary module in the redundant configuration in the **Secondary Slot Num** field.

Step 7 Choose one of the following redundancy options for the Primary module from the **Redundancy Type** drop-down arrow:

- **yCable**—specifies a 1:1 (y cable) redundancy configuration for a yCable. For the **yCable** option, only one module is used and acts as the backup for the other.
- **oneToN**—specifies a a 1:N redundancy configuration for oneToN. For the **oneToN** option, only one module (secondary) is used and acts as the backup for other primary modules.

Step 8 Click **Apply** to add redundancy.

Figure 5-5 Redundancy Information Window



5.5.1.2 Modifying a Card for Redundancy

To modify a card for redundancy:

Step 1 In the Domain Manager, select the node and choose **Configuration > MGX880/8850 MG > Configuration Center** to display the Configuration Window for Elements.

Step 2 Click the **Cards** tab to display a summary report of all the cards that are installed on the node.

Step 3 Choose **Redundancy Info** from the **Category** drop-down arrow to display the redundancy status for the node.

Step 4 Select the card from the list of redundant cards.

Step 5 Click **Details** to display the Redundancy Configuration window. See Figure 5-5.

Step 6 Enter the slot number of the Secondary module in the redundant configuration in the **Secondary Slot Num** field.

Step 7 Choose one of the following redundancy options for the Primary module from the **Redundancy Type** drop-down arrow:

- **yCable**—specifies a 1:1 (y cable) redundancy configuration for a yCable. For the **yCable** option, only one module is used and acts as the backup for the other.
- **oneToN**—specifies a a 1:N redundancy configuration for oneToN. For the **oneToN** option, only one module (secondary) is used and acts as the backup for other primary modules.

Step 8 Click **Apply** to modify the card for redundancy.

5.6 Which Ports Are Reserved in Cisco MGM?

The Cisco MGM server communicates with the managed network via the data communication network (DCN) using the CORBA protocol.

Note If there a firewall between the Cisco MGM server and the NE, a static CORBA port needs to be assigned manually. This port can then be opened on the firewall.

Caution Reserved ports are required for the Cisco MGM server to communicate with NEs, the GUI, or other northbound gateways. Care must be taken when changing any reserved port in Cisco MGM, as a change could mean that communication is lost.

This section includes the following information:

- 5.6.1 Client-Server Communication Protocols
- 5.6.2 Ports between the Cisco MGM Server and Clients
- 5.6.3 Ports between the Cisco MGM Server and MGX Switches
- 5.6.4 Changing the Cisco MGM Server Port

5.6.1 Client-Server Communication Protocols

Cisco MGM uses the following protocols for client-server communication:

- CORBA
- JMOCO (Cisco Proprietary TCP/IP-based request/response protocol)
- SSH or Telnet
- Java Database Connectivity (JDBC)

5.6.2 Ports between the Cisco MGM Server and Clients

Table 5-22 lists the ports that the Cisco MGM server uses to communicate with the Cisco MGM clients.

Table 5-22 Cisco MGM Server and Client Ports

Module or Protocol	Port
Apache HTTP port	8051
CORBA IIOP listener port on CTM server	Dynamic
CORBA naming service	14005
CORBA notification service	Dynamic
Database listener port	1521 (configurable)
Internal process-to-process communication ports	9000 to 9011
JMOCO port	27613 (configurable)
JMS web server	8033
JNDI port	1099
Orbix ports	3075, 3079, 3094
RMI Registry port	19999
RTM Proxy port	8161
SNMP command port	161 **Note** Port 161 is used only for communication between SNMP-managed NEs and the CTM server, not for communication between the CTM client and server.
SNMP trap forwarding port	8765 (configurable)
SNMP trap port	162 **Note** Port 162 is used only for communication between SNMP-managed NEs and the CTM server, not for communication between the CTM client and server.
SSH port	22
Telnet port	23
UDP port to receive traps	2500
Web services port	1551

5.6.3 Ports between the Cisco MGM Server and MGX Switches

Table 5-22 lists the ports that the Cisco MGM server uses to communicate with the Cisco MGX switches.

Table 5-23 Cisco MGM Server and MGX Switches

Module or Protocol	Port
Daytime port	13
SSH port	22
Telnet port	23
UDP port to receive traps	2500

5.6.4 Changing the Cisco MGM Server Port

Use the NE Service Properties pane to change the TCP port number of the Cisco MGM server. All Cisco MGM clients use the JMOCO port to connect to the Cisco MGM server. See Table 5-22 for detailed information on the JMOCO port.

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **NE Service** to open the NE Service Properties pane. Click the **NE Poller** tab.

Step 3 Change the server port in the Cisco MGM Server Port field. The server port in the Active column displays the current port. The server port in the After Restart column displays the port that is active after the server is restarted.

Step 4 Click **Save**. Changes to this parameter take effect only after the server is restarted.

5.7 How Do I Export Information in Tables?

You can export fault, performance, configuration or administration information from a table within Cisco MGM to a flat file. The options to export information in tables to a text file or an HTML file are available from the following windows:

- Alarm Browser
- Alarm Log
- Audit Log
- Cisco MGM Users
- Domain NE Table
- Equipment Inventory Table
- Error Log
- Job Monitor

- Service Monitor
- Supported NE Table

Most Cisco MGM tables support an export function to export the table contents to a flat file. It is possible to select the separator as comma, tab, or a user specified character. Other options include the ability to check for the separator in the exported data. All rows in the active page of the selection can be exported or only selected rows.

Some Cisco MGM tables can return large numbers of rows. To support large tables Cisco MGM provides a paging feature. If more than 1000 rows of data are returned, data is grouped in pages of up to 1000 rows. It then possible to page forward and back to view the entire set of data.

The following sections discuss how to export information in tables to a text file or an HTML file:

- 5.7.1 Exporting Data to a Text File
- 5.7.2 Generating an HTML Report
- 5.7.3 Printing an HTML Report

5.7.1 Exporting Data to a Text File

To export data to a text file:

Step 1 In the Domain Explorer tree, select the management domain, group, or NE node.

Step 2 Open a window under the File, Fault, or Administration menu for the selected node. See the options listed in 5.7 How Do I Export Information in Tables?

Step 3 Within the table, click the **Export Data to File** tool (or choose **File > Export**). The Export dialog box appears.

Step 4 In the Export dialog box, specify whether to export data in comma-separated value format, tab-separated value format, or another user-specified form.

Step 5 (Optional) To export only the selected row(s), check the **Export selected row(s) only** check box.

Step 6 Specify a location for the file in the **Export to file** text box. Or, click **Browse** to browse for a destination location. (The default directory is C:\Cisco\MediaGatewayManagerClient\exports or /opt/CiscoMGMClient/exports.)

Step 7 Enter a filename and click **OK** to export the data to the file.

5.7.2 Generating an HTML Report

Many Cisco MGM tables have an HTML Report tool for generating an HTML report on selected fault, performance, configuration, or administrative data. To generate an HTML report:

Step 1 In the Domain Explorer tree, select the management domain, group, or NE node.

Step 2 Open a window under the File, Fault, or Administration menu for the selected node. See the options listed in 5.7 How Do I Export Information in Tables?

Step 3 In the table, click the **Generate HTML Report** tool (or choose **File > HTML Report**). The HTML Report dialog box appears.

Step 4 In the HTML Report dialog box, select either of the following:

- Selected row(s)—Export only the selected rows.
- All rows in current page—Export all rows in the table.

A maximum of 1000 rows per page can be exported.

Note To save more than 1000 rows of data, export them to a text file. For information about exporting to a text file, see section 5.7 How Do I Export Information in Tables?, page 5-53.

Step 5 Click **OK** to generate the HTML report. The report is saved automatically on the client system. (The default directory is C:\Cisco\MGMClient\reports or /opt/CiscoMGMClient/reports.)

5.7.3 Printing an HTML Report

To print a Cisco MGM HTML report, use the default browser Print option. To print a Cisco MGM HTML report:

Step 1 Generate the HTML report. See section 5.7.2 Generating an HTML Report, page 5-54.

Step 2 Navigate to the directory where the HTML report is saved on the client system. (The default directory is C:\Cisco\MGMClient\reports or /opt/CiscoMGMClient/reports.) Double-click the report to be printed.

Step 3 The default browser displays the HTML report. Use the browser Print option to print the report.

Configuring Hardware

This chapter helps you configure your hardware using the Cisco MGM Configuration Center and Chassis View, and contains the following sections:

- 6.1 How Do I Manage My Network with the Chassis View?, page 6-1
- 6.2 How Do I Manage My Network with the Configuration Center?, page 6-5
- 6.3 How Do I Manage Templates for Network Elements?, page 6-11
- 6.4 How Do I Configure Cisco MGX 8880 and 8850 Nodes?, page 6-13
- 6.5 How Do I Create or Modify APS?, page 6-31
- 6.6 How Do I Configure AXSM Cards?, page 6-33
- 6.7 How Do I Configure VXSM Cards?, page 6-61
- 6.8 How Do I Configure RPM Cards?, page 6-116
- 6.9 How Do I Configure VISM-PR Cards?, page 6-121

6.1 How Do I Manage My Network with the Chassis View?

The Chassis View provides a graphical view of equipment status for the operational and alarm status of each card, port, or line, which is represented with a predefined color. By default, the front view appears (click the Rear View tab to switch views).

These tasks can be performed using Chassis View:

- 6.1.1 Launching Chassis View, page 6-2
- 6.1.2 Navigating with Chassis View, page 6-3

6.1.1 Launching Chassis View

To launch Chassis View from the Domain Explorer:

- Click on a node, then choose **Configuration > MGX 8880/8850 MG > Chassis View**.

To launch Chassis View from the Diagnostic Center, Configuration Center, or Statistics Report:

- Click the **Chassis View** tool from the toolbar

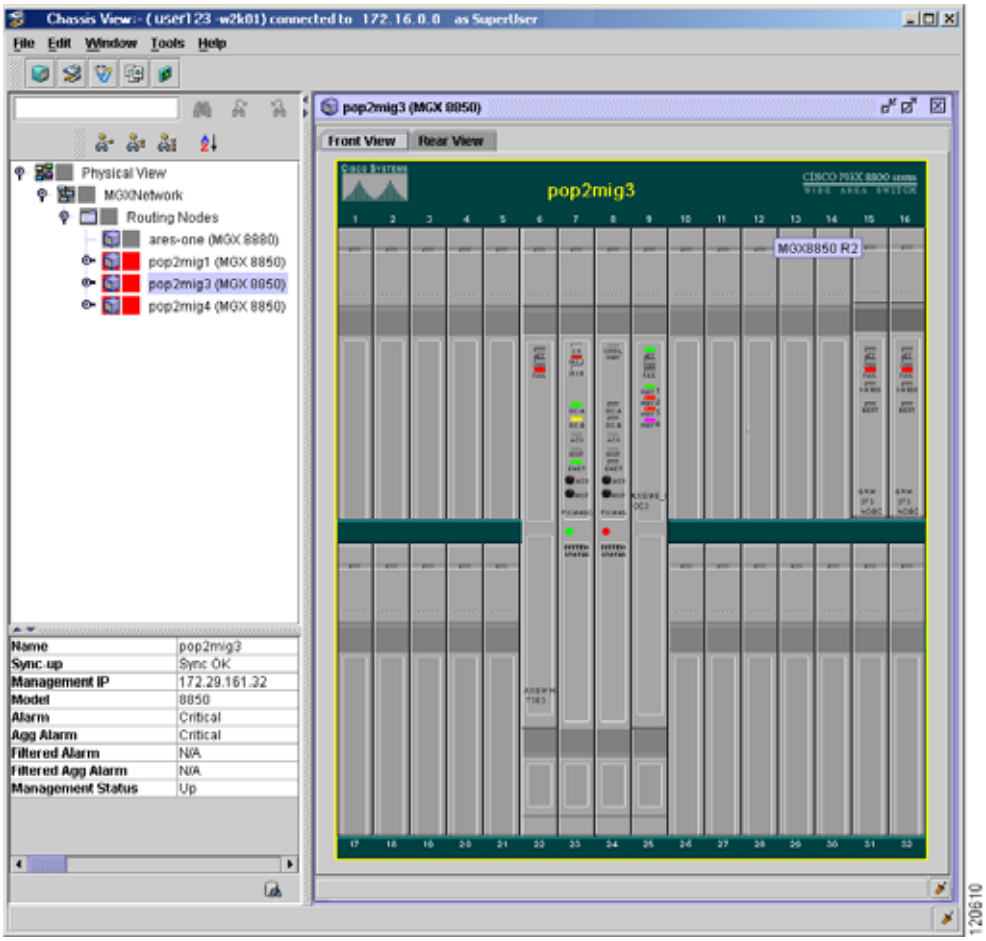
  or

- Choose **Tools > Chassis View**

  or

- Right-click on an NE in the Hierarchy pane and choose **Chassis View** from the pop-up menu. Once the Chassis View opens, the corresponding window appears in the Configuration pane.

Figure 6-1 Chassis View—Front View



6.1.2 Navigating with Chassis View

The Chassis View main window contains the following components:

- Menu bar—See Table 6-1
- Toolbar—See Table 6-2
- Hierarchy, Configuration, and Inspector panes—See Table 6-3

Table 6-1 Chassis View—Menu Bar Options

Menu Bar Options	Task
File	
Close	Closes the current Chassis View main window when you are running multiple sessions of the Chassis View. If you are running only one session, that single session is closed.
Exit	Exits the Chassis View instance and the other sessions. This option works only on the window in which the option is selected. When you have started other Chassis Views, they continue to run. Exits the Chassis View instance and the other sessions. This option will close all the Chassis View windows launched in this Cisco MGM session.
Edit	
Copy	Copies the selected object and puts it into the Clipboard.
Paste	Pastes the object into the Clipboard and inserts it to the target area.
Tools	
Chassis View	Launches the Chassis View for the selected object. For more information, see section 6.1 How Do I Manage My Network with the Chassis View?, page 6-1
Configuration Center	Launches the Configuration Center for the selected object.
Diagnostic Center	Launches the Diagnostic Center for the selected object. For more information, see Chapter 9, “Managing Faults.”
Statistics Report	Launches the Statistics Report for the selected object. For more information, see Chapter 10, “Managing Performance.”
Administration	Allows you to perform adminstration-type tasks, such as: • Cisco MGM Audit Trail—Allows you to access audit trail files for specified days. • Telnet—(Only available when a NE is selected) Opens a command line tool to telnet to MGX switches. • SSH—(Only available when a NE is selected) Opens a command line tool to gain secure shell access to MGX switches.
Help	
Color Legend	Displays the Cisco MGM color legend.
Contents	Displays the contents for online help.

Table 6-2 Chassis View—Toolbar Buttons

Option	Task
Chassis View	Launches Chassis View for the selected object. If no object is selected, Chassis View launches, and the right hand area is empty.
Configuration Center	Launches Configuration Center for the selected object. If no object is selected, Configuration Center launches, and the right hand area is empty.
Diagnostics Center	Launches Diagnostics Center for the selected object. If no object is selected, Diagnostics Center launches, and the right hand area is empty.
Statistics Report	Launches the Statistics Report.
Administration	Launches the Cisco MGM Audit Trail Viewer. For more information, see section 8.3.2 Viewing the Audit Trail File, page 8-4.

Table 6-3 Chassis View—Hierarchy, Configuration, and Inspector Pane Descriptions

Options	Task
Hierarchy pane	Navigates and displays objects for selection and configuration. For more information, see Chapter 2, “Basic Concepts.”
Inspector pane	Provides a list of detailed status information for the NE selected in the Hierarchy pane. For more information, see Chapter 2, “Basic Concepts.”
Configuration pane	Displays the chassis view for the selected object. If no object is selected, the Configuration pane will be empty. Within the Configuration pane, there are two tabs: • Front View—Shows the front view configuration. • Rear View—Shows the rear view configuration.

6.1.2.1 Accessing Network Elements

To view the chassis view for a NE in the Hierarchy pane:

- Drag-and-drop the NE from the Hierarchy pane to the Configuration pane

  or

- Double-click on the NE in the Hierarchy pane

The corresponding view opens or is highlighted in the Configuration pane.

Tip Any window within the Hierarchy pane can be “pinned” down by clicking on the pin tool, located in the bottom right corner of each window. This means that when you open other windows, the tacked down window will remain open. For more information on this feature, see Chapter 2, “Basic Concepts.”

6.1.2.2 Chassis View LED Colors

The following LED colors are used in the Chassis View:

Table 6-4 LED Colors for Chassis View

Color	State
Red	Critical
Orange	Major
Yellow	Minor
Green	Up, OK, and Clear
Purple	Self-test (loopback)
Gray	Down (unmanaged)
Blue	Unknown
Cyan	Not defined

6.2 How Do I Manage My Network with the Configuration Center?

By managing network elements with the Configuration Center, you can:

- Configure numerous managed device objects, such as configuration settings, interface status, and so forth in a media gateway.
- Display and modify the values for almost all of the objects.
- Perform tasks, such as element configuration and connection management.

These tasks are used to manage the NE configurations through the Configuration Center:

- 6.2.1 Launching Configuration Center, page 6-6
- 6.2.2 Navigating with Configuration Center, page 6-7
- 6.2.3 Navigating Within Tables, page 6-9

6.2.1 Launching Configuration Center

To launch Configuration Center from the Domain Explorer:

- Click on a node, then choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration pane for that node appears.

To launch Configuration Center from the Diagnostic Center, Chassis View, or Statistics Report:

- Click the **Configuration Center** tool within the toolbar

  or

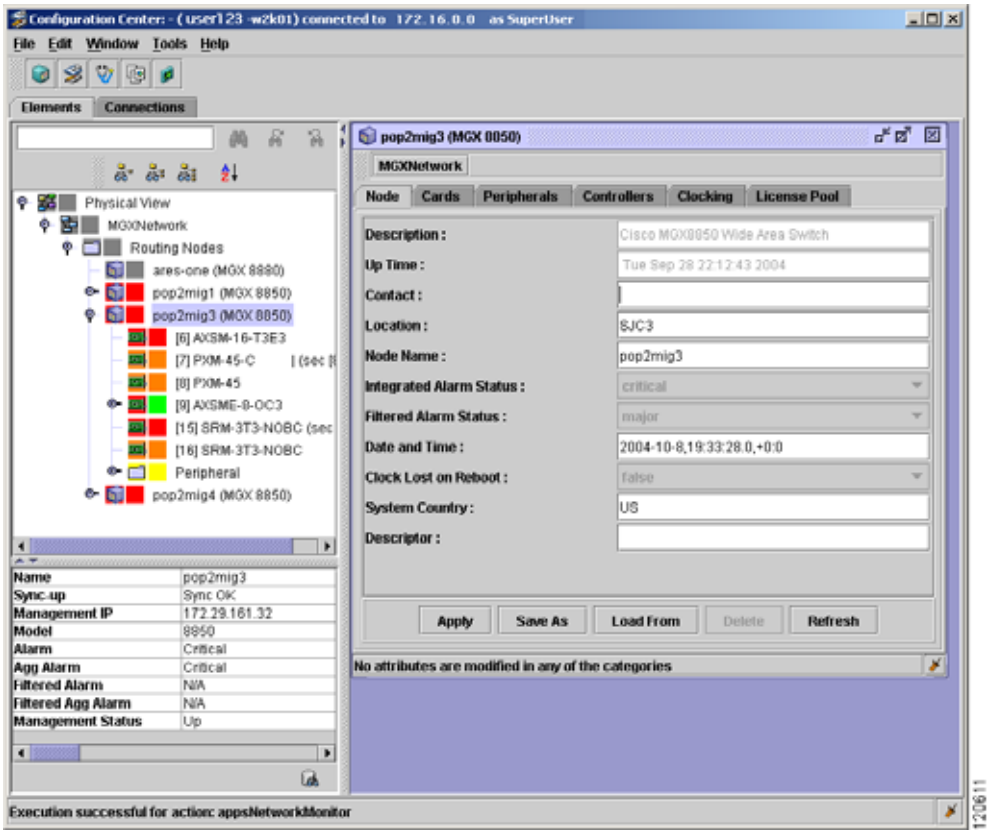
- Choose **Tools > Configuration Center**

  or

- Right-click on an NE and choose **Configuration Center** from the pop-up menu. Once the Configuration Center opens, the corresponding window appears in the Configuration pane.

After the Configuration Center application is launched, the Configuration Center main window appears. For information about the main window components, see section 6.2.2 Navigating with Configuration Center, page 6-7.

Figure 6-2 Configuration Center—Node Tab



6.2.2 Navigating with Configuration Center

The Configuration Center main window contains the following components:

- Menu bar—See Table 6-5
- Toolbar—See Table 6-6
- Hierarchy, Configuration, and Inspector panes—See Table 6-7

Table 6-5 Configuration Center—Menu Bar Options

Menu Bar Options	Task
File	
Save	Saves the content.
Print	Displays the Print window to process printing.
Close	Closes the current Configuration Center main window when you are running multiple sessions of the Configuration Center. If you are running only one session, that single session is closed.
Exit	Exits the Configuration Center instance and the other sessions. This option works only on the window in which the option is selected. When you have started other Configuration Centers, they continue to run. Exits the Configuration Center instance and the other sessions. This option will close all the Configuration windows launched in this Cisco MGM session.
Edit	
Cut	Removes the selection from the text field.
Copy	Copies the selected object and puts it into the Clipboard.
Paste	Pastes the object into the Clipboard and inserts it to the target area.
Connection Templates	(*Only applicable from the Connections tab*) Displays connection templates.
Show Unused Descriptors	(*Only applicable from the Connections tab*) Shows unused descriptors.
Tools	
Chassis View	Launches the Chassis View for the selected object. For more information, see section 6.1 How Do I Manage My Network with the Chassis View?, page 6-1
Configuration Center	Launches the Configuration Center for the selected object.
Diagnostic Center	Launches the Diagnostic Center for the selected object. For more information, see Chapter 9, “Managing Faults.”
Statistics Report	Launches the Statistics Report for the selected object. For more information, see Chapter 10, “Managing Performance.”

Table 6-5 Configuration Center—Menu Bar Options (continued)

Menu Bar Options	Task
Administration	Allows you to perform adminstration-type tasks, such as: • Cisco MGM Audit Trail—Allows you to access audit trail files for specified days. • Telnet—(Only available when a NE is selected) Opens a command line tool to telnet to MGX switches. • SSH—(Only available when a NE is selected) Opens a command line tool to gain secure shell access to MGX switches.
Help	
Color Legend	Displays the Cisco MGM color legend.
Contents	Displays the contents for online Help.

Table 6-6 Configuration Center—Toolbar Buttons

Option	Task
Chassis View	Launches Chassis View for the selected object. If no object is selected, Chassis View launches, and the right hand area is empty.
Configuration Center	Launches Configuration Center for the selected object. If no object is selected, Configuration Center launches, and the right hand area is empty.
Diagnostics Center	Launches Diagnostics Center for the selected object. If no object is selected, Diagnostics Center launches, and the right hand area is empty.
Statistics Report	Launches the Statistics Report
Administration	Launches the Cisco MGM Audit Trail Viewer. For more information, see section 8.3.2 Viewing the Audit Trail File, page 8-4.

Table 6-7 Configuration Center—Hierarchy, Configuration and Inspector Pane Descriptions

Options	Task
Hierarchy pane	Navigates and selects objects for configuration. For more information, see Chapter 2, "Basic Concepts." Within the Hierarchy pane, there are two tabs: • Elements—Configures the node, card, line, and port. • Connections—Configures the connections.

Table 6-7 Configuration Center—Hierarchy, Configuration and Inspector Pane Descriptions (continued)

Options	Task
Configuration pane	Depending on the active tab (Elements or Connections), the configuration details for the selected object appear. If an object is not selected, the Configuration pane is empty. Fields within the Configuration pane with a * indicate required fields. Fields that have been modified appear blue.
Inspector pane	Provides a list of detailed status information for the network element selected from the Hierarchy pane. For more information, see Chapter 2, "Basic Concepts."

6.2.2.1 Accessing Network Elements

To perform configuration tasks, you can open any NE in the Hierarchy pane, either:

- Drag-and-drop the NE from the Hierarchy pane to the Configuration pane

  or

- Double-click on the NE in the Hierarchy pane

The corresponding configuration window opens in the Configuration pane.

Tip Any window within the Hierarchy pane can be "pinned" down by clicking on the pin tool, located in the bottom right corner of each window. This means that when you open other windows, the tacked down window will remain open. For more information on this feature, see Chapter 2, "Basic Concepts."

6.2.3 Navigating Within Tables

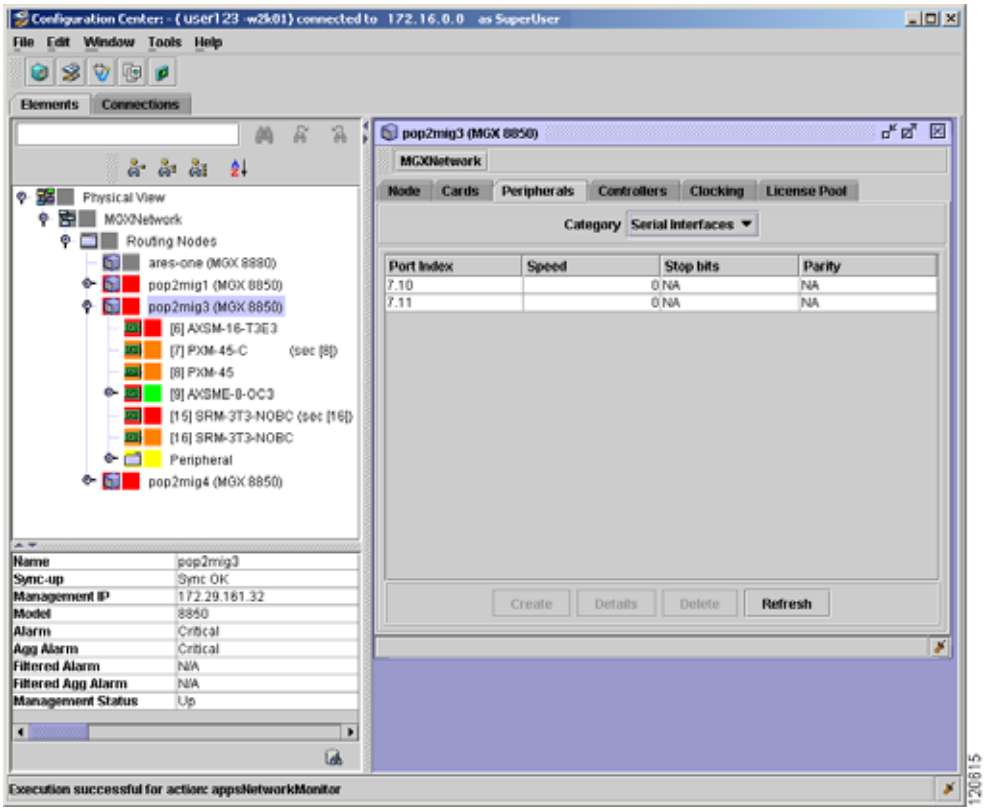
Many tabs within the Configuration pane contain tables. Within each table, there are four buttons:

Note Some of these buttons may be grayed out, depending on availability.

- Create—Allows you to create a new table entry (opens a new window)
- Details—Allows you to view or modify detailed information about a selected entry (opens a new window)
- Delete—Allows you to delete an entry
- Refresh—Refreshes the table

For example, see Figure 6-3.

Figure 6-3 Configuration Center—Peripherals Tab, Serial Interfaces Category



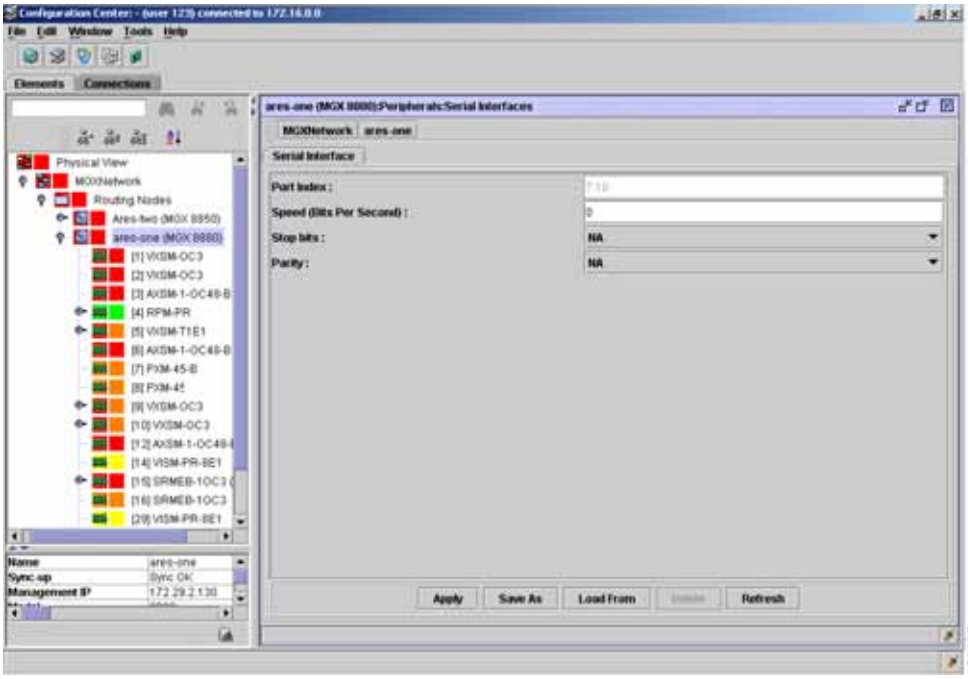
If you select the Create or Details button, a new window appears. This window contains five buttons:

Note Some of these buttons may be grayed out, depending on availability.

- Apply—Applies any modifications or additions
- Save As—Allows you to save the current parameters as a named template
- Load From—Provides a list of templates to load parameters from
- Delete—Deletes the information
- Refresh—Refreshes the data

For example, see Figure 6-4.

Figure 6-4 Configuration Center—Peripherals Tab, Serial Interface Details



6.3 How Do I Manage Templates for Network Elements?

- 6.3.1 Saving Templates for Network Elements, page 6-11
- 6.3.2 Loading or Deleting Templates for Network Elements, page 6-12

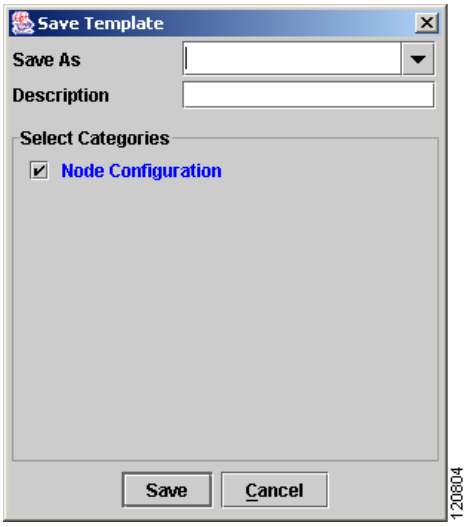
6.3.1 Saving Templates for Network Elements

For any specified network element (such as a node, card, line, port, or connection), you can save the current parameters as a template.

Note For details on creating connection templates, see section Chapter 7, "Provisioning Connections."

Step 1 From the Configuration Center main window, under the **Elements** tab, double-click the node, card, line, port, or connection whose parameters you want to save, then click **Save As** to display the Save Template window.

Figure 6-5 Save Template Window



Step 2 Enter the new name for the template in the **Save As** field.

Step 3 Enter a description for the template in the **Description** field.

Step 4 Ensure that the listed categories are correct in the **Selected Categories** area.

Step 5 Click **Save** to save the current network element template, or **Cancel** to exit without saving.

6.3.2 Loading or Deleting Templates for Network Elements

Step 1 From the Configuration Center main window, under the **Elements** tab, double-click the node, card, line, port or connection you want to load or delete a template on.

Step 2 Under the appropriate subtab, click **Load From** to display a list of available templates.

Step 3 Select the template name from the list of templates.

Step 4 Click **Load** to load the template for a particular category group

or

Click **Delete** to delete an existing template

or

Click **Cancel** to exit without saving

or

Click **Refresh** to refresh the window.

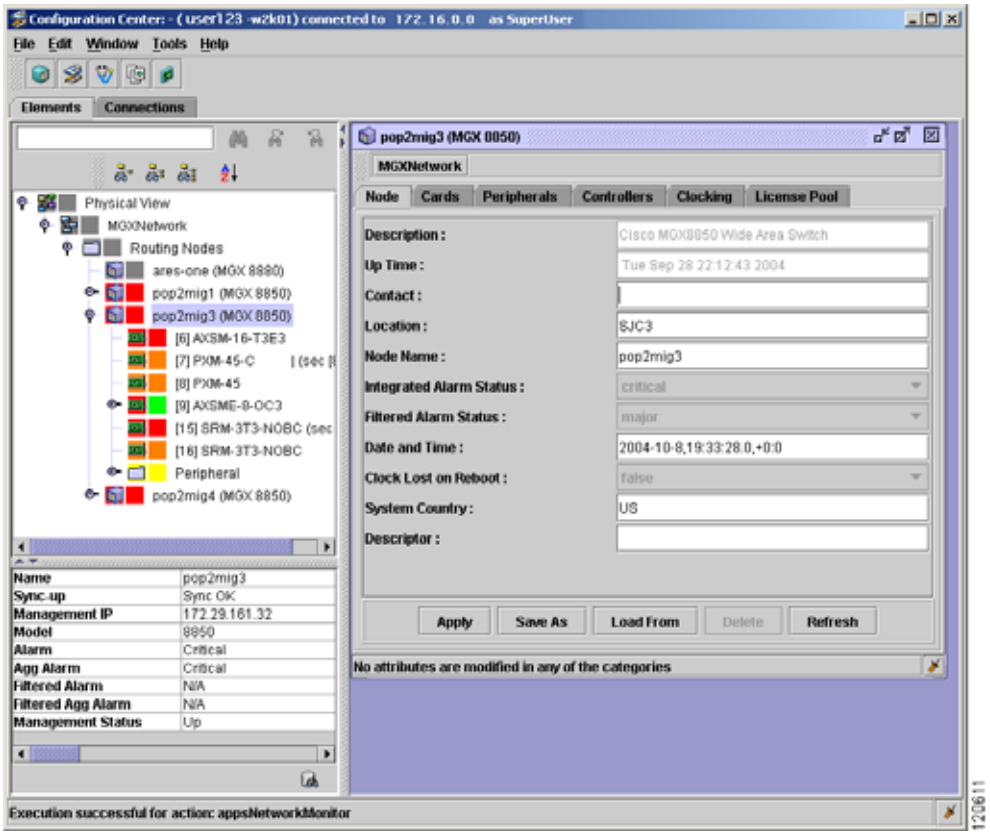
6.4 How Do I Configure Cisco MGX 8880 and 8850 Nodes?

- 6.4.1 Configuring a Node, page 6-13
- 6.4.2 Displaying Cards Within a Node, page 6-15
- 6.4.4 Managing Node Peripherals, page 6-19
- 6.4.5 Viewing Node Controllers, page 6-25
- 6.4.6 Managing Node Clocking, page 6-26

6.4.1 Configuring a Node

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens. The **Node** tab appears by default.

Figure 6-6 Configuration Center—Node Tab



Note Table 6-8 describes the fields in the Node tab.

Step 2 Check or configure each field, as applicable.

Note Some fields are grayed out, meaning they are not configurable.

Step 3 Click **Apply** to apply the current node configuration settings.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-8 Field Descriptions for the Node Tab

Field Name	Description
Description	Description of the managed node.
Up Time	System up time of the current node.
Contact	Contact person for the managed node.
Location	Physical location of the node.
Node Name	Administratively assigned name for the node.
Integrated Alarm Status (read-only)	Integrated alarm status of the shelf. The following options are valid: • Clear • Minor • Major • Critical
Filtered Alarm Status (read-only)	Filtered alarm status of the shelf. The following options are valid: • Clear • Minor • Major • Critical
Date and Time	Current local date and time for the system.
Clock Lost on Reboot (if applicable)	Indicates whether the system can preserve knowledge of current date and time across a system reboot.
System Country	Country where the system is physically located.
Descriptor	Node descriptor.

6.4.2 Displaying Cards Within a Node

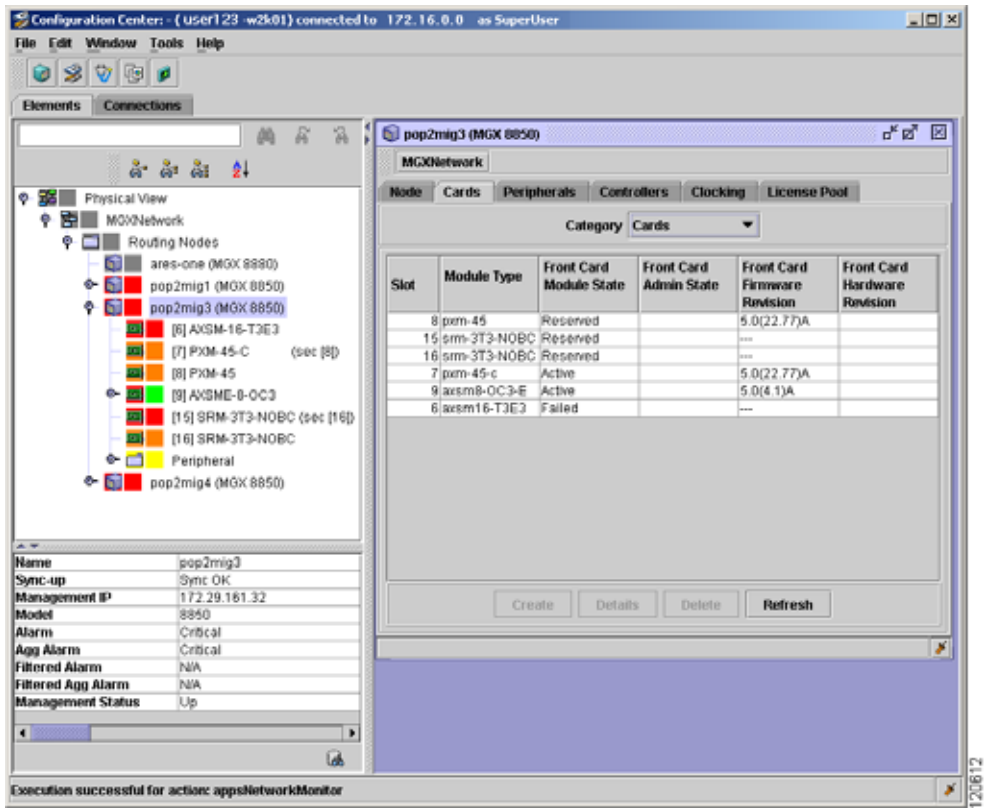
Displaying cards within a node allows you to verify that the correct cards are installed in the correct slots, and that the back cards installed are indeed compatible with the front cards they serve.

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Cards** tab to display a summary report of all the cards installed on the node. The Cards category appears by default in the drop-down arrow.

Note For detailed information on the Redundancy Info option, see Chapter 5, "Maintaining an Efficient Network."

Figure 6-7 Configuration Center—Cards Tab



6.4.3 Verifying a Specific Card for the Node

You can verify a card when the objects to be managed are associated with a particular card.

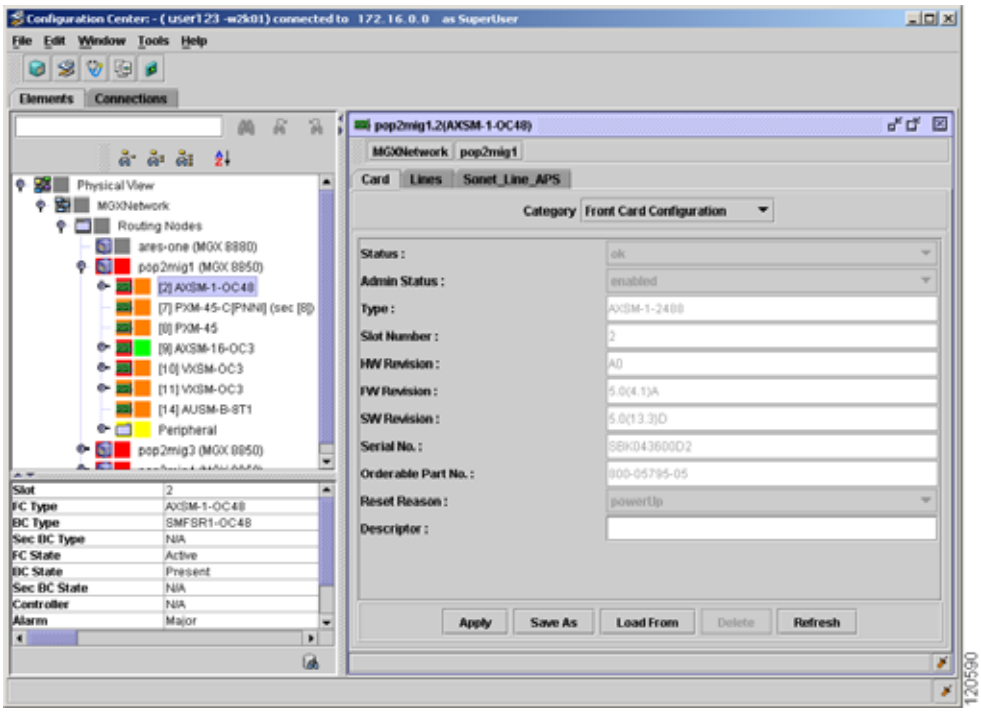
Step 1 Within the **Cards** tab (see 6.4.2 Displaying Cards Within a Node, page 6-15) select the card from the summary report, then click **Details**.

or

Within the Configuration Center Hierarchy pane, double-click the card you want to view details for.

The **Card** tab appears (for example, Figure 6-8 displays the AXSM card tab).

Figure 6-8 Configuration Center—AXSM Card Tab



Note Table 6-9 describes fields in the Card tab.

Step 2 Choose one the following card configurations from the **Category** drop-down arrow:

- **Front Card Configuration**
- **Back Card Configuration**
- **Sec Back Card Configuration (optional)**
- **System Information (RPM only)**
- **Entity Sensors (VXSM only)**
- **Card Information (VISM-PR only)**
- **Daughter Card Information (VISM-PR only)**

Note The Back Card Configuration or Sec Back Card Configuration options are read-only.

Step 3 (Optional) Within the **Front Card Configuration** option, enter the card descriptor in the **Descriptor** field.

Note The **Descriptor** field is valid for the whole Card Configuration, but is available only from the first category of that card configuration, in this case the Front Card Configuration.

Step 4 (Optional) Within the **System Information** option, enter the **Node Name**.

Step 5 Click **Apply** to modify the card descriptor and to verify the information for the card is valid.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-9 Field Descriptions for the Cards Tab

Category	Field Name	Description
Front, Back, and Sec Back Card Configuration (applicable fields vary for each)	(Operational) Status	Operational state of the module.
	Card Description	Front card description.
	Admin Status	Administrative control of the module.
	Type	Textual description of physical entity.
	Slot Number	Number of the physical entity.
	Hardware (HW) Revision	Vendor-specific hardware description string.
	Firmware (FW) Revision	Vendor-specific firmware description string.
	SW Revision	Vendor-specific software description string.
	Serial Number	Vendor-specific serial number string.
	Orderable Part No	Name of the manufacturer.
	Reset Reason	Reason for last reset.
	Descriptor	Card descriptor.

Table 6-9 Field Descriptions for the Cards Tab (continued)

Category	Field Name	Description
Front, Back, and Sec Back Card Configuration (continued)	Secondary Description (*RPM only*)	Secondary back card description.
	Secondary Serial Number (*RPM only*)	Secondary back card serial number.
	Secondary Hardware Revision (*RPM only*)	Secondary back card hardware revision.
	Secondary Firmware Revision (*RPM only*)	Secondary back card firmware revision.
	Secondary Operational Status (*RPM only*)	Secondary back card operational status.
	Save Running Config button (*RPM only*)	Allows you to save any configuration changes on the router, in order to keep those changes after a reboot.
System Information (*RPM only*)	Sys Description	Textual description of the system entity.
	Up Time	Time (in hundredths of a second) since the network management portion of the system was last re-initialized.
	Contact	ID and contact information of the contact person for this managed node.
	Node Name	Administratively assigned name for the managed node.
	Location	Physical location of the node.
	Services	Indicates a set of services that the system offers.
Entity Sensors, Entity Sensors Tab	Sensor Description	Textual description of the sensor.
	Sensor Type	Type of data reported by the entSensorValue. This variable is set by the agent at startup and the value does not change during operation.
	Sensor Scale	Indicates the exponent to apply to sensor values reported by entSensorValue. This variable is set by the agent at startup and the value does not change during operation.
	Sensor Value	Reports the most recent measurement detected by the sensor.
	Sensor State	Indicates the present operational state of the sensor.

Table 6-9 Field Descriptions for the Cards Tab (continued)

Category	Field Name	Description
Entity Sensors, Sensor Threshold Tab	Threshold Index	Index that uniquely identifies an entry in the entSensorThreshold table. This index permits the same sensor to have several different thresholds.
	Threshold Severity	Severity of this threshold.
	Threshold Relation	Relation between sens or value and threshold value, required to trigger the alarm.
	Threshold Value	Value of the threshold.
	Threshold Evaluation	Result of the most recent evaluation of the threshold.
	Threshold Notification	Controls generation of entSensorThresholdNotification for this threshold.
Card Information (*VISM-PR only*)	Slot Number	Slot number of the card.
	Card Type	This object holds the type of the card, for processor module as well as service module.
	Card Change Type	Type of card change.
Daughter Card Information (*VISM-PR only*)	Daughter Card Serial Number	The serial number is on the non-volatile RAM on the P daughter card, entered by the manufacturer.
	Daughter Card Description	Describes the VISM-PR daughter card.
	Daughter Card Hardware (HW) Revision	Hardware revision number for the daughter card.

6.4.4 Managing Node Peripherals

These tasks are used to manage peripherals:

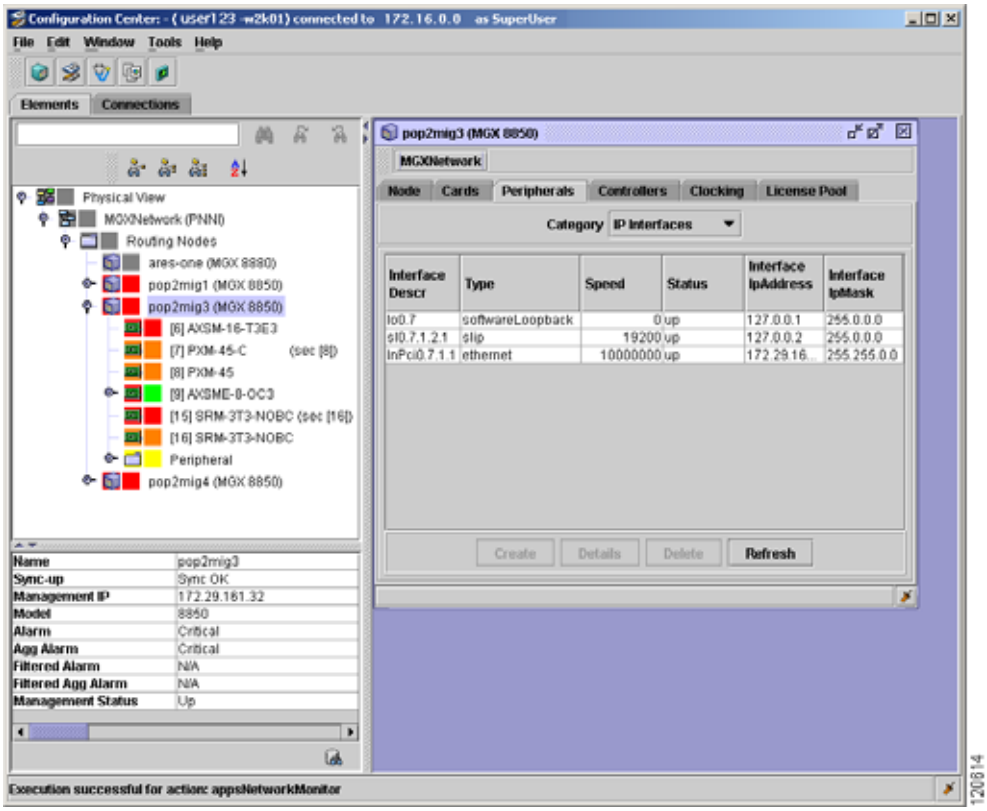
- 6.4.4.1 Displaying IP Interfaces, page 6-19
- 6.4.4.2 Configuring Serial Interfaces, page 6-20
- 6.4.4.3 Displaying Sensors, page 6-23

6.4.4.1 Displaying IP Interfaces

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Peripherals** tab. The **IP Interfaces** option appears by default in the **Category** drop-down arrow.

Figure 6-9 Configuration Center—Peripherals Tab, IP Interfaces Category



Step 3 (Optional) Click **Refresh** to refresh the table.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

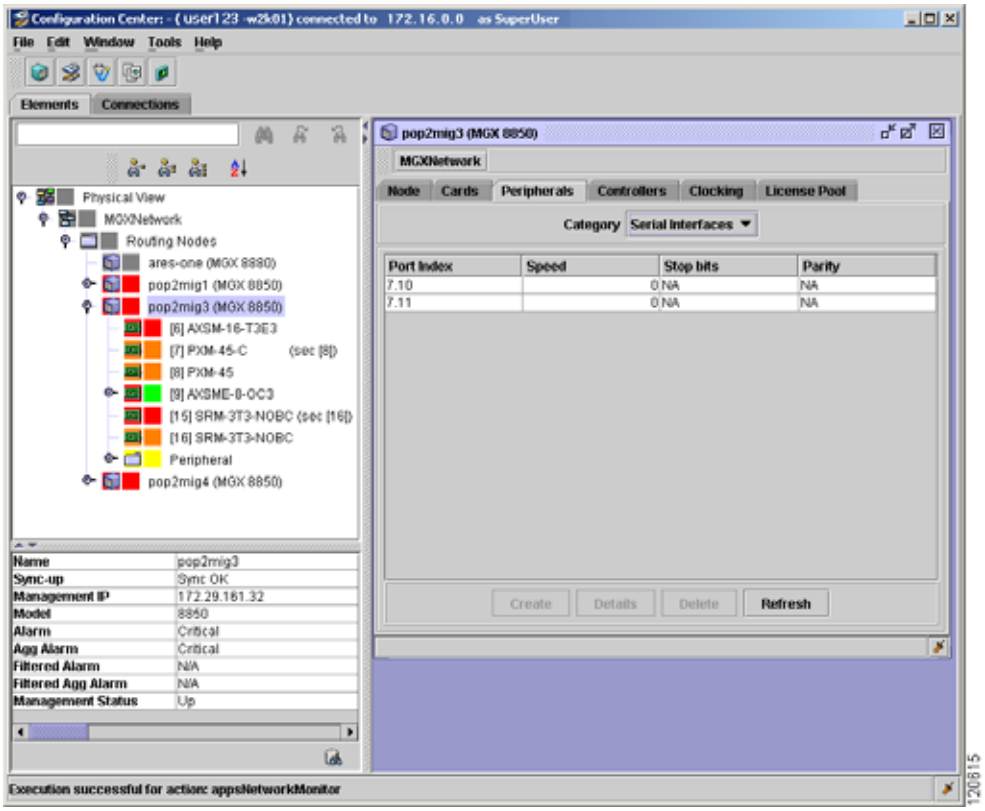
6.4.4.2 Configuring Serial Interfaces

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Peripherals** tab.

Step 3 Choose the **Serial Interfaces** option from the **Category** drop-down arrow.

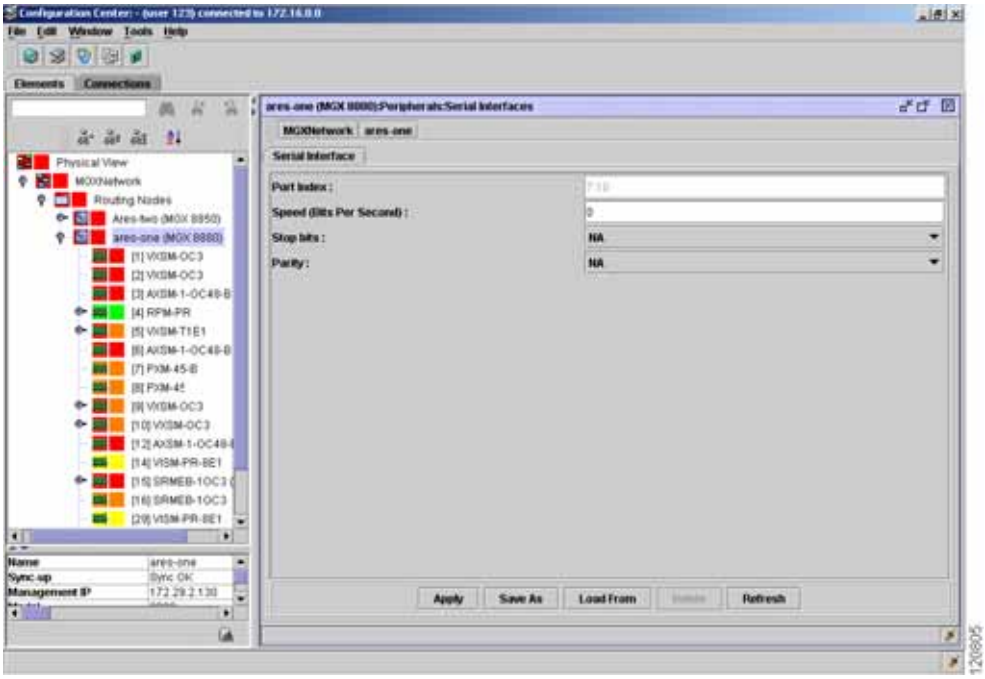
Figure 6-10 Configuration Center—Serial Interfaces Category



Step 4 (Optional) Click **Details** to view or modify information about a selected controller. The **Serial Interface** tab appears.

Note For a description of all buttons within this table, see section 6.2.3 Navigating Within Tables, page 6-9.

Figure 6-11 Configuration Center—Peripherals Tab, Serial Interface Tab



a. Enter the **Speed**, and configure the **Stop Bits** and **Parity**, if applicable.

b. Click **Apply**.

Note Table 6-10 describes the fields in the Serial Interfaces tab.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-10 Field Descriptions for the Serial Interfaces Tab

Field Name	Description
Port Index	Interface index of the port.
Speed (Bits Per Second)	The input speed of the port.
Stop bits	The number of stop bits on the port: • NA • one • two • oneAndHalf • dynamic
Parity	The port's sense of a character parity bit: • NA • none • odd • even • mark • space

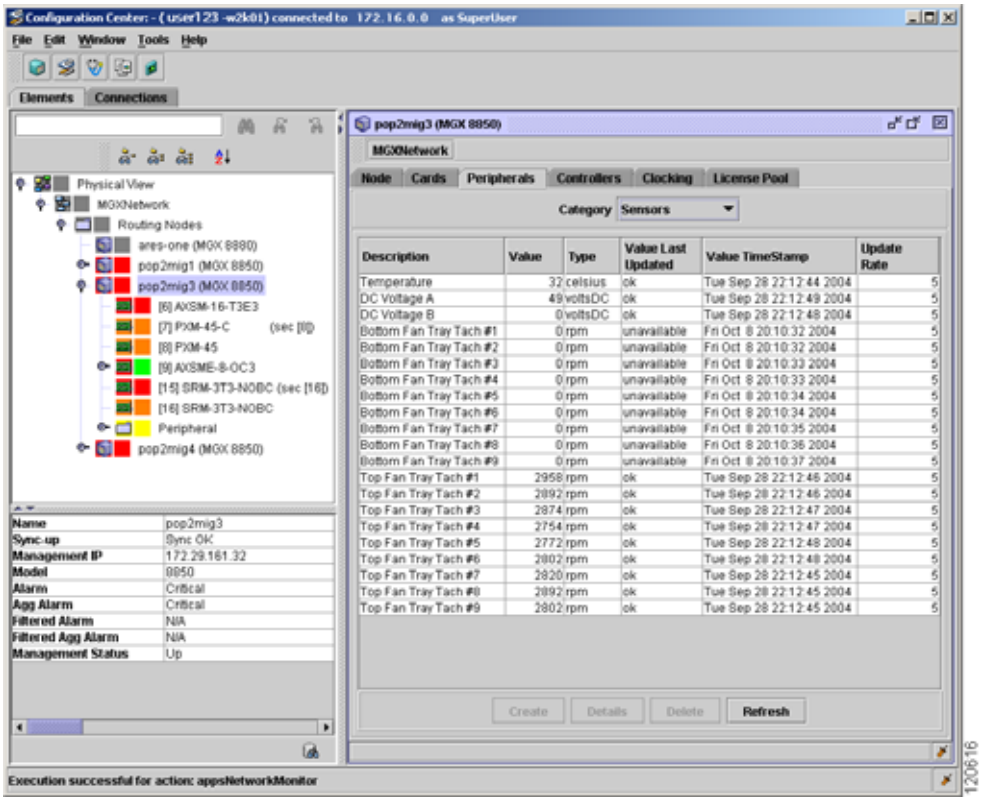
6.4.4.3 Displaying Sensors

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Peripherals** tab.

Step 3 Choose the **Sensors** option from the **Category** drop-down arrow.

Figure 6-12 Configuration Center—Peripherals Tab, Sensors Category



Note Table 6-11 describes the fields in the Sensors table.

Step 4 (Optional) Click **Refresh** to refresh the table.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-11 Field Descriptions for the Sensors Table

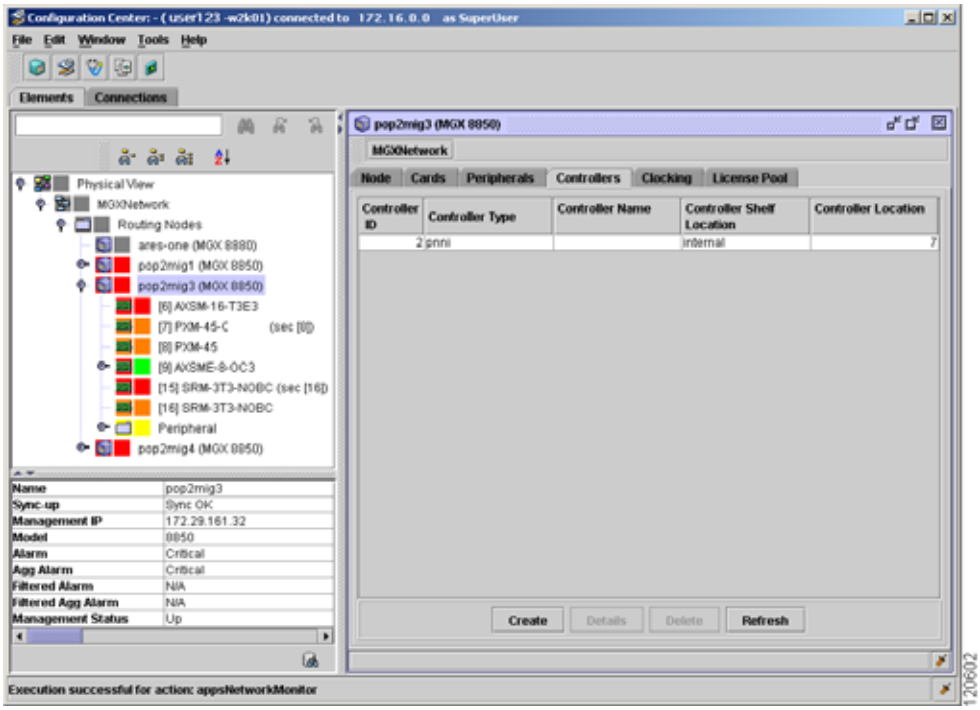
Field Name	Description
Description	Specifies the type of environmental state, such as temperature, DC voltage, bottom fan tray, and so forth.
Value	Reports the most recent measurement seen by the sensor.
Type	Indicates the type of data reported by the Value parameter. The variable is set by the agent at start-up and the value does not change during operation.
Value Last Updated	Indicates the status of the value.
Value TimeStamp	Indicates the date and time of the value reported in the Value parameter.
Update Rate	Indicates the rate that the agent updates the Value parameter.

6.4.5 Viewing Node Controllers

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Controllers** tab.

Figure 6-13 Configuration Center—Controllers Tab



Note Table 6-12 describes fields in the Controllers table.

Step 3 (Optional) Click any one of the following buttons:

- **Create** to create a new controller
- **Details** to view or modify information about a selected controller
- **Delete** to delete a controller
- **Refresh** to refresh the table

Table 6-12 Field Descriptions for the Controllers Table

Field Name	Description
Controller ID	Unique value for VSI controller (VSI master).
Controller Type	Identifies the controller type.
Controller Name	Name chosen by the user for the VSI controller.
Controller Shelf Location	Identifies the location of the controller shelf.
Controller Location	Identifies the location of the controller.

6.4.6 Managing Node Clocking

On Cisco MGX 8850 (PXM1E) switches, clock source configuration is done on the PXM1E card and passed to other nodes over PXM1E lines.

On Cisco MGX 8850 (PXM45) switches, clock source configuration is done on a PXM45 card, and clock sourcing information is passed to other nodes over AXSM lines.

Cisco MGM supports the manual clock configuration method of network clock synchronization for the Cisco MGX switches. Manual clock configuration configures both a primary and secondary clock source, which are distributed throughout the network. The secondary clock source takes over if the primary clock source fails. You can configure a network setup with one master clock source, and a secondary to ensure network clock stability.

You can manage three types of node clocking:

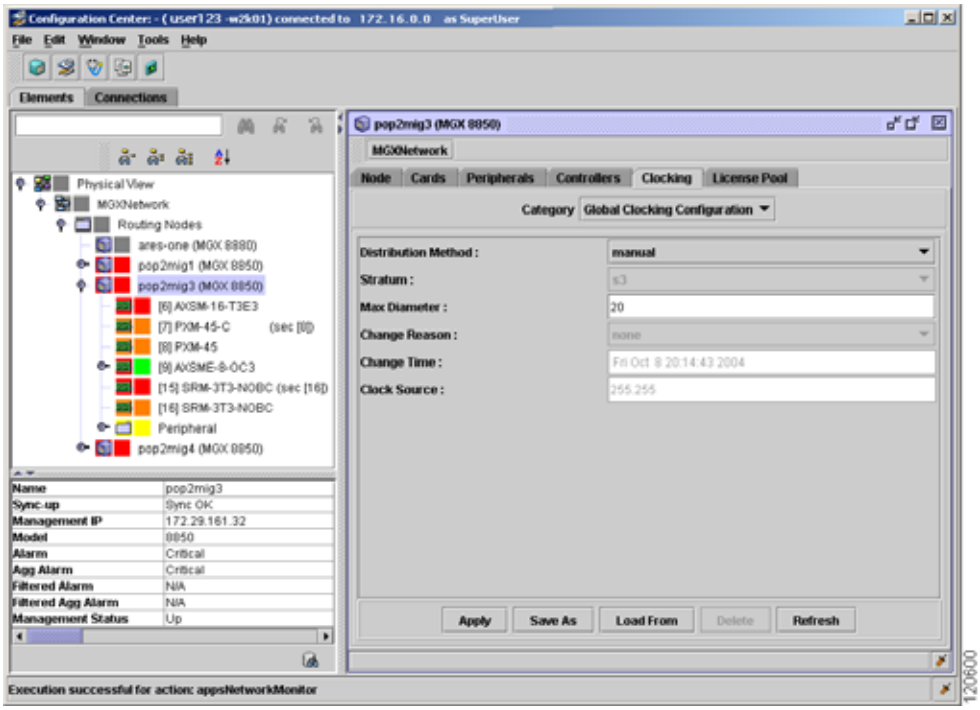
- 6.4.6.1 Configuring Global Clocking, page 6-26
- 6.4.6.2 Viewing Available Clock Sources, page 6-27
- 6.4.6.3 Viewing or Creating Manual Clock Sources, page 6-28

6.4.6.1 Configuring Global Clocking

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Clocking** tab. The **Global Clocking Configuration** option appears by default in the **Category** drop-down arrow.

Figure 6-14 Configuration Center—Clocking Tab, Global Clocking Configuration Category



Note Table 6-13 describes fields in the Clocking tab.

Step 3 (Optional) Modify the fields as desired.

Step 4 (Optional) Click any one of the following buttons:

- **Apply**—Applies any modifications or additions
- **Save As**—Allows you to save the current parameters as a named template
- **Load From**—Provides a list of templates to load parameters from
- **Refresh**—Refreshes the data

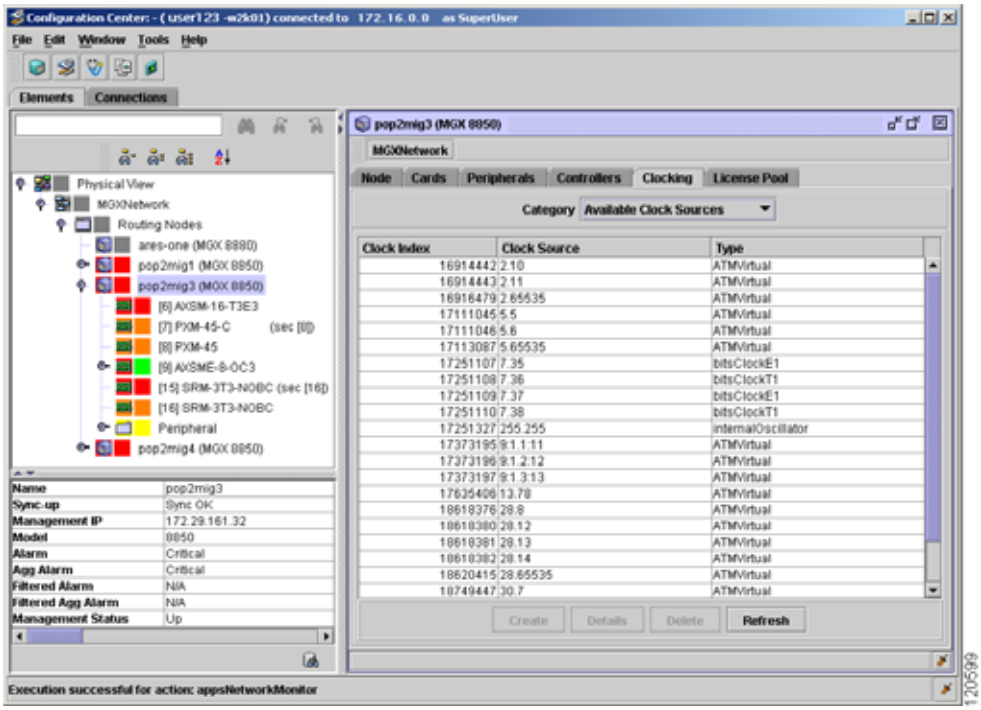
6.4.6.2 Viewing Available Clock Sources

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Clocking** tab.

Step 3 Choose the **Available Clock Sources** option from the **Category** drop-down arrow.

Figure 6-15 Configuration Center—Clocking Tab, Available Clock Sources Category



Note Table 6-13 describes fields in the Clocking tab.

Step 4 (Optional) Click **Refresh** to reload the table data.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

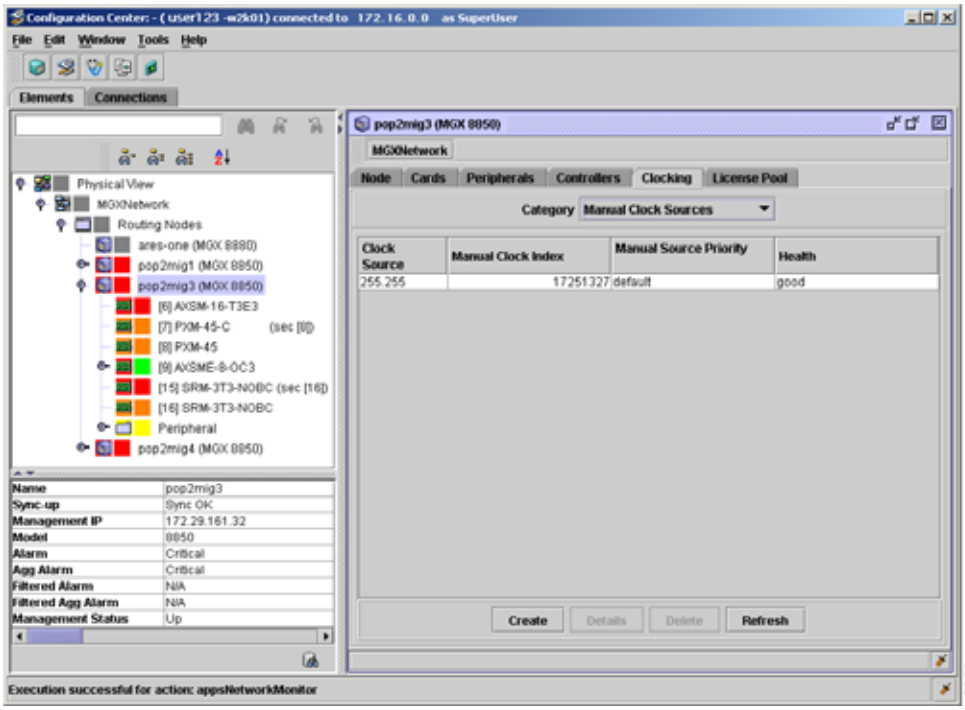
6.4.6.3 Viewing or Creating Manual Clock Sources

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Click the **Clocking** tab.

Step 3 Choose the **Manual Clock Sources** option from the **Category** drop-down arrow.

Figure 6-16 Configuration Center—Clocking Tab, Manual Clock Sources Category



Note Table 6-13 describes fields in the Clocking tab.

Step 4 To create a new clock source, proceed as follows:

a. Click **Create**. Complete the following fields:

- **Priority**
- **Clock Source Index**

b. Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-13 Field Descriptions for the Clocking Tab

Category	Field Name	Description
Global Clocking Configuration	Distribution Method	Method used to distribute the network clock for the device.
	Stratum	This variable contains the stratum level of the node.
	Max Diameter	The maximum possible height of a network clock distribution tree in the network.
	Change Reason	Reason for the most recent change of a source of network clock, as indicated by the change in the value of "ciscoWanChangeTimeStamp."
	Change Time	Value of sysUpTime when the most recent change of a source of network clock occurred.
	Clock Source	Description of the clock source associated with this entry.
Available Clock Sources	Clock Index	Clock index number.
	Clock Source	Description of the clock source associated with this entry.
	Type	Type of clock.
Manual Clock Sources table	Clock Source	Description of the clock source associated with this entry.
	Manual Clock Index	Manual clock index number.
	Manual Source Priority	Manual source priority.
	Health	Health of the clock source.
Manual Clock Sources Create window	Priority	Value used to configure an available network clock source to be primary, secondary, or default manual clock source.
	Clock Source Index	An index value used to identify the primary, secondary, or default manual clock source.
	Clock Source	Description of the clock source associated with this entry.
	Health	Health of the clock source.

6.5 How Do I Create or Modify APS?

Automatic Protection Switching (APS) can be configured on SONET lines within SRME or AXSM and VXSM OC-type cards.

If you are setting up APS on multiple cards, you must first set up an APS connector and then set up redundancy on the node (for details on setting up redundancy, see 5.5.1 Configuring Card Redundancy, page 5-49.)

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Double-click an AXSM, SRME or VXSM card.

Step 3 Click the **Sonet Line APS** tab. Within the Sonet Line APS tab, you can:

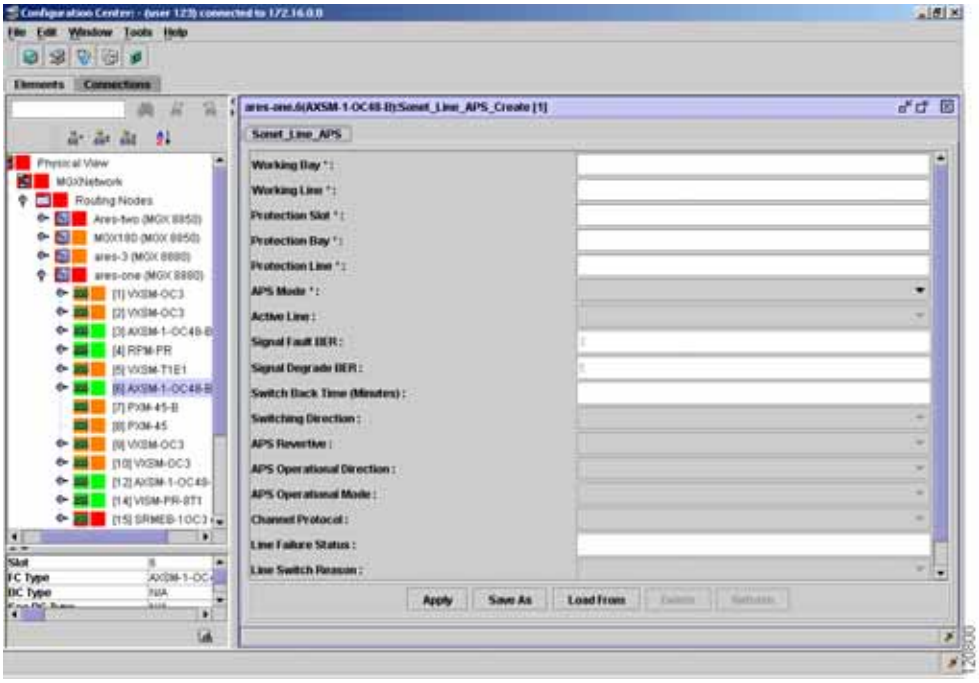
a. Click **Create** to create a new Sonet Line APS

or

b. Select the line you want to modify, then click **Details**

Note The AXSM card is used in Figure 6-17 as an example.

Figure 6-17 Configuration Center—AXSM Sonet Line APS Tab



Step 4 Configure the fields.

Step 5 Click **Apply** to save any changes.

Note Table 6-27 describes fields in the Sonet Line APS tab.

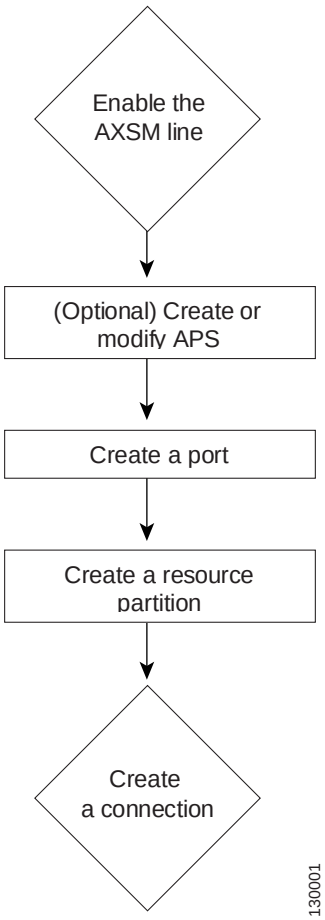
For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-14 Field Descriptions for the Sonet Line APS Tab

Field Name	Description
Working Bay	Working bay number.
Working Line	Working line number.
Protection Slot	Protection slot number.
Protection Bay	Protection bay number.
Protection Line	Protection line number.
APS Mode	Configures APS architecture mode on the working/protection line pairs.
Active Line	Indicates which line is active.
Signal Fault BER	Contains the bit error rate threshold for signal fault detection on the working line.
Signal Degrade BER	Contains the bit error rate threshold for signal degrade detection on the working line.
Switch Back Time (minutes)	Contains interval (in minutes) to wait before attempting to switch back to the working line.
Switching Direction	Configures the switching direction supported by this APS line.
APS Revertive	Configures the APS revertive or non-revertive option.
APS Operational Direction	Shows the actual APS direction that is implemented on the Near End terminal.
APS Operational Mode	Shows the actual APS architecture mode that is implemented on the Near End terminal.
Channel Protocol	Allows configuration of APS channel protocol to be implemented at the Near End terminal.
Line Failure Status	APS line failure status.
Line Switch Reason	APS line switch reason.
Working Section	Indicates which working section is the APS primary section.

6.6 How Do I Configure AXSM Cards?

Figure 6-18 Process for Configuring AXSM Cards



ATM Switch Service Module, or AXSM cards, can be configured in Cisco MGM by performing the following steps:

Step 1 Enable the AXSM line—See the following sections:

- For an OC-type AXSM card, see 6.6.1 Enabling SONET Lines for AXSM, page 6-34

  or

- For a T1-type AXSM card, see 6.6.2 Enabling DS1 Lines for AXSM, page 6-45

  or

- For a T3-type AXSM card, see 6.6.3 Enabling DS3 Lines for AXSM, page 6-47

Step 2 (Optional) Create or modify APS—See 6.6.4 Creating or Modifying AXSM Sonet Line APSs, page 6-53.

Step 3 Create a port—See 6.6.5 Creating a Port for AXSM, page 6-55.

Step 4 Create a resource partition—See 6.6.6 Creating a Resource Partition for AXSM, page 6-57.

Step 5 Create a connection—For information on creating connections, see Chapter 7, "Provisioning Connections."

6.6.1 Enabling SONET Lines for AXSM

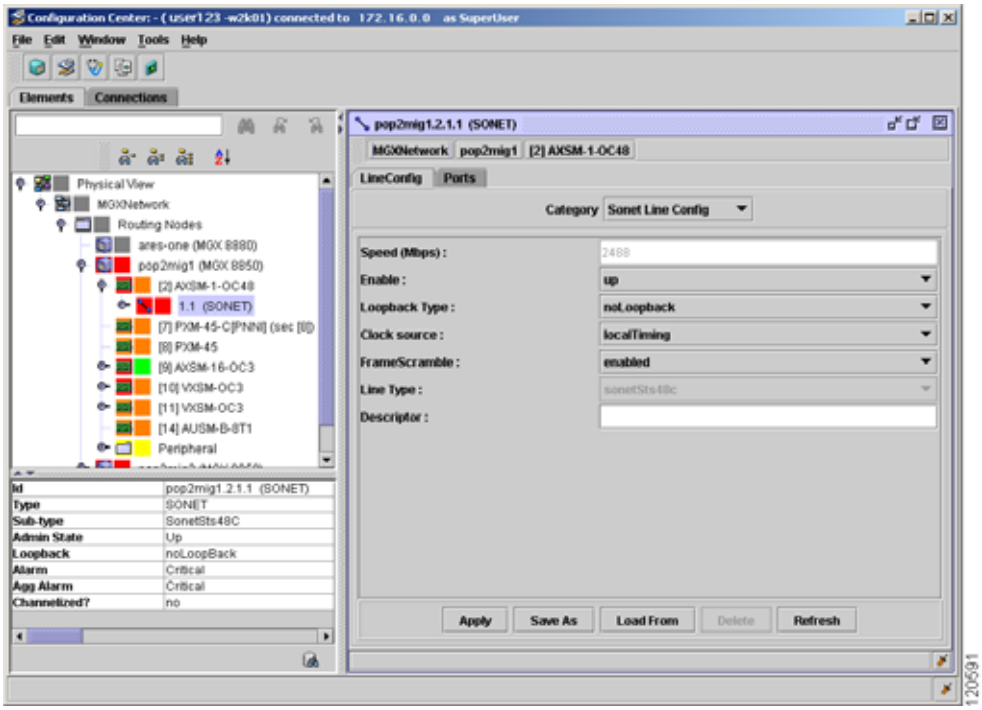
Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click an AXSM (OC) card.

Step 3 Click the **Lines** tab. Click on the line you want to enable, then click **Details**. The **Line Config** tab appears, with the **Sonet Line Config** category selected by default.

Note For details on the Ports tab, see section 6.6.5 Creating a Port for AXSM, page 6-55.

Figure 6-19 Configuration Center—AXSM Sonet Line Config Tab, Sonet Line Config Category



Step 4 Choose the **Up** option from the **Enable** drop-down arrow.

Step 5 (Optional) Verify or modify additional fields, as desired.

Note Table 6-15 describes fields in the AXSM Line Config tab, Sonet Line Config category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

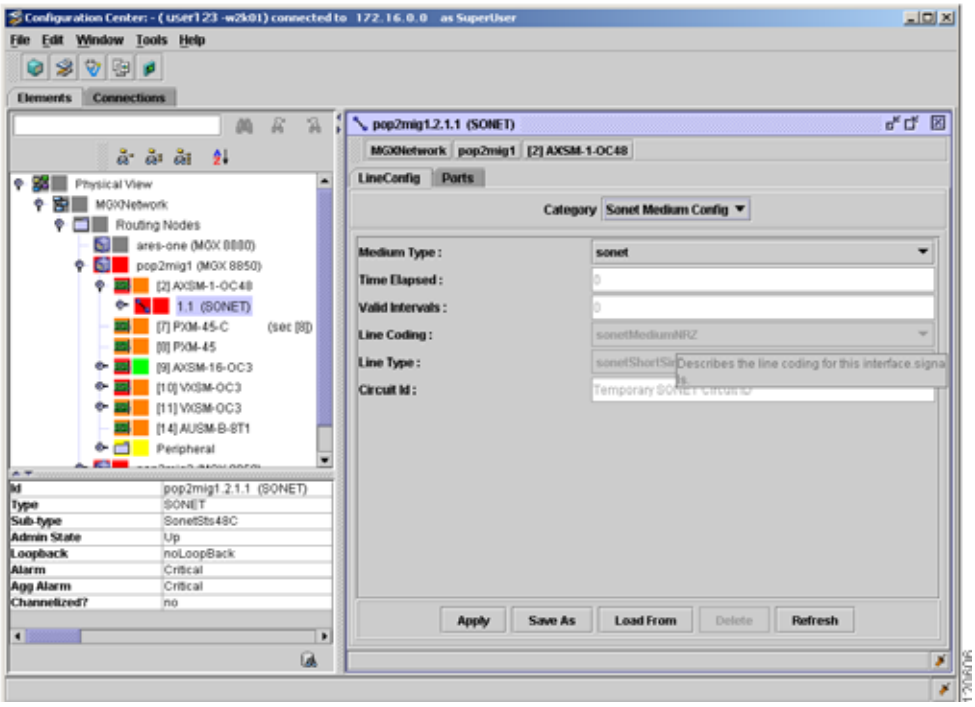
Table 6-15 Field Descriptions for the AXSM Line Config Tab, Sonet Line Config Category

Field Name	Description
Speed (Mbps)	An estimate of the interface's current bandwidth in units of 1,000,000 bits per second.
Enable	Desired state of the interface: • **up**—enables the line • **down**—disables the line
Loopback Type	Desired loopback mode configuration of the line: • **noLoopback**—Specifies no loopback state. • **lineLocal**—Signal sent at the line is looped back through the device. • **lineRemote**—Signal sent does not go through the device but is looped back out.
Clock Source	Specifies the source of the transmit clock.
Frame Scramble	Enables or disables the scrambling option in the line.
Line Type	Configured line type.
Descriptor	Line descriptor.

6.6.1.1 Configuring Sonet Medium Config

Step 1 Within the **Line Config** tab (see 6.6.1 Enabling SONET Lines for AXSM, page 6-34) choose the **Sonet Medium Config** option from the **Category** drop-down arrow.

Figure 6-20 Configuration Center—AXSM Sonet Line Config Tab, Sonet Medium Config Category



Note Table 6-16 describes fields in the AXSM Line Config tab, Sonet Medium Config category.

Step 2 Choose the appropriate option from the **Medium Type** drop-down arrow.

Step 3 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

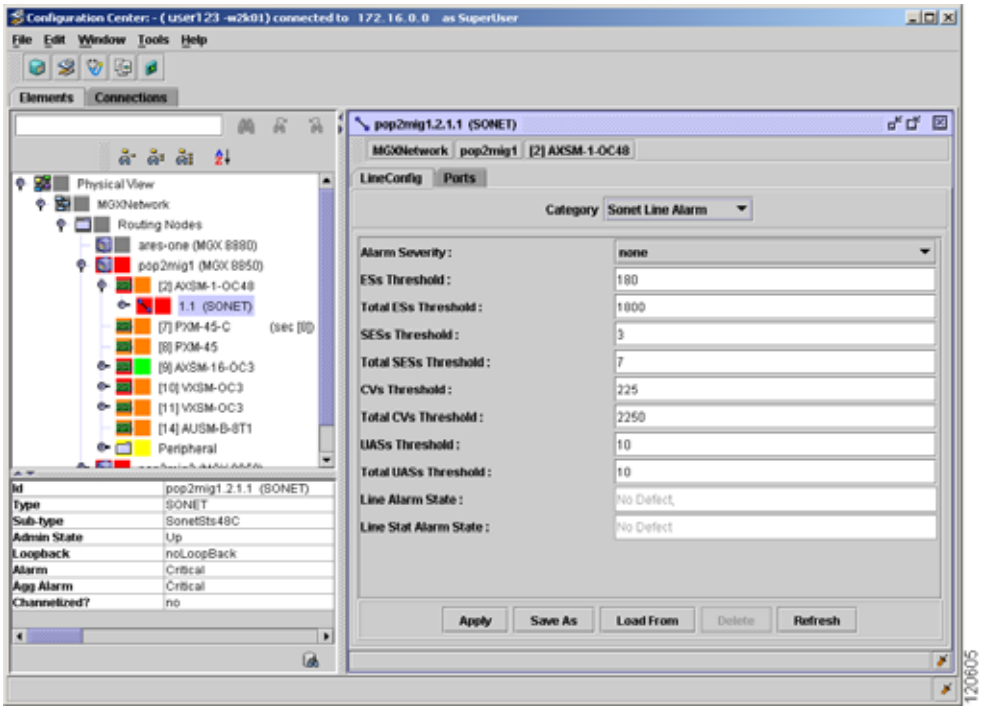
Table 6-16 Field Descriptions for the AXSM Line Config Tab, Sonet Medium Config Category

Field Name	Description
Medium Type	Identifies whether a SONET or SDH signal is used across the interface.
Time Elapsed	Number of seconds (including partial seconds) elasped since the beginning of the current measurement period.
Valid Intervals	Number of previous 15 minute intervals for which data was collected.
Line Coding	Describes the line coding for the interface signals: • **sonetMediumOther** • **sonetMediumB3ZS** • **sonetMediumCMI** • **sonetMediumNRZ** • **sonetMediumRZ** **Note** The B3ZS and CMI are used for electrical SONET/SDH signals (STS-1 and STS-3). The NRZ is used for the optical SONET/SDH signals.
Line Type	Describes the line type for this interface: • **sonetOther** • **sonetShortSingleMode** • **sonetLongSingleMode** • **sonetMultimode** • **sonetCoax** • **sonetUTP** **Note** The line types are short-and long-range single-mode fiber or multi-mode fiber interfaces, coax, and UTP for electrical interfaces.
Circuit ID	The transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting. **Note** The circuit identifier, if available, is also represented by ifPhysAddress.

6.6.1.2 Configuring the Sonet Line Alarm

Step 1 Within the **Line Config** tab (see 6.6.1 Enabling SONET Lines for AXSM, page 6-34) choose the **Sonet Line Alarm** option from the **Category** drop-down arrow.

Figure 6-21 Configuration Center—AXSM Line Config Tab, Sonet Line Alarm Category



Note Table 6-17 describes fields in the AXSM Line Config tab, Sonet Line Alarm category.

Step 2 Choose the appropriate option from the **Alarm Severity** drop-down arrow. Input the other fields with data as desired.

Step 3 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Note The following thresholds are the same for Far End and Near End.

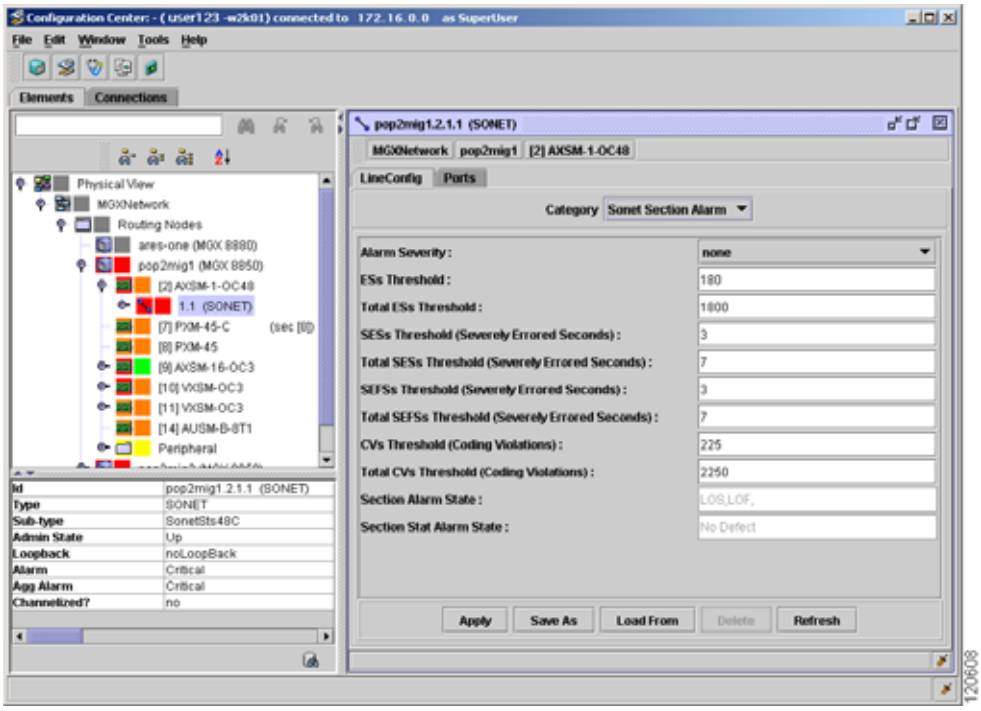
Table 6-17 Field Descriptions for the AXSM Line Config Tab, Sonet Line Alarm Category

Field Name	Description
Alarm Severity	Setting this option to major or minor raises a corresponding severity alarm when any statistical threshold is exceeded. **Note** For alarm severity definitions, see Chapter 9, "Managing Faults."
ESs Threshold	Threshold value for Errored Seconds detection for the current 15 minute interval, above which an alarm is generated.
Total ESs Threshold	Threshold value for Errored Seconds detection for the 24 hour interval, above which an alarm is generated.
SESs Threshold	Severely Errored Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total SESs Threshold	Severely Errored Seconds threshold for the 24 hour interval, above which an alarm is generated.
CVs Threshold	Coding Violations threshold for the current 15 minute interval, above which an alarm is generated.
Total CVs Threshold	Coding Violations threshold for the 24 hour interval, above which an alarm is generated.
UASs Threshold	Unavailable Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total UASs Threshold	Unavailable Seconds threshold for the 24 hour interval, above which an alarm is generated.
Line Alarm State	Current alarm status of the line.
Line Stat Alarm State	Indicates the line stat alarm status.

6.6.1.3 Configuring the Sonet Section Alarm

Step 1 Within the **Line Config** tab (see 6.6.1 Enabling SONET Lines for AXSM, page 6-34) choose the **Sonet Section Alarm** option from the **Category** drop-down arrow.

Figure 6-22 Configuration Center—AXSM Line Config Tab, Sonet Section Alarm Category



Note Table 6-18 describes fields in the AXSM Line Config tab, Sonet Section Alarm category.

Step 2 Choose the appropriate option from the **Alarm Severity** drop-down arrow. Input the other fields with data as desired.

Step 3 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Note The following thresholds are the same for Far End and Near End.

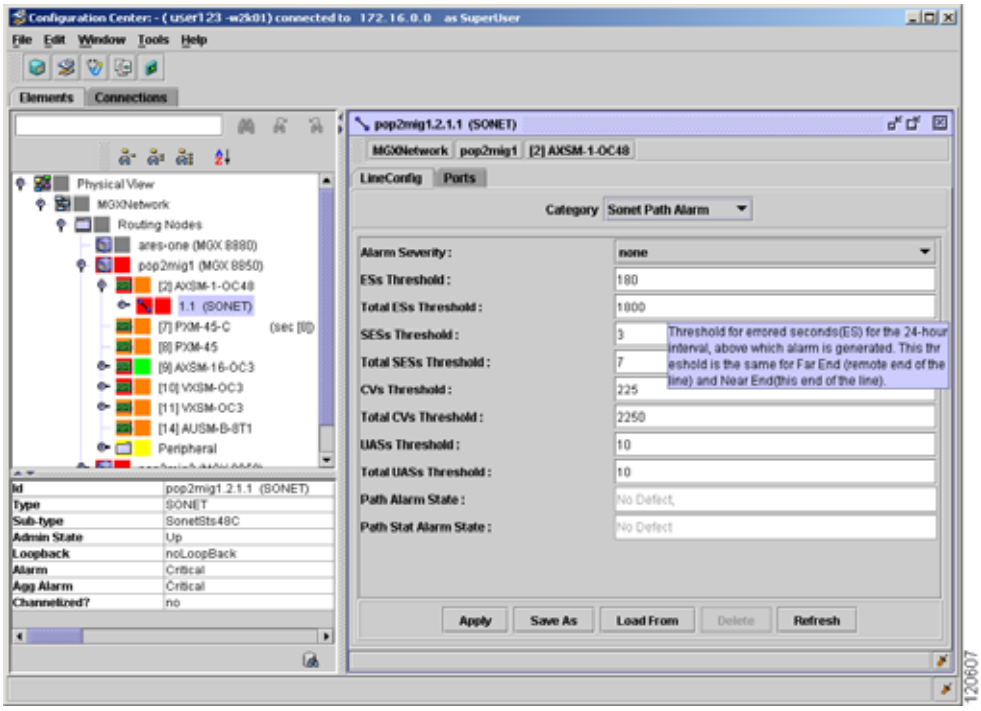
Table 6-18 Field Descriptions for the AXSM Line Config Tab, Sonet Section Alarm Category

Field Name	Description
Alarm Severity	Setting this option to major or minor raises a corresponding severity alarm when any statistical threshold is exceeded. **Note** For alarm severity definitions, see Chapter 9, "Managing Faults."
ESs Threshold	Threshold value for Errored Seconds detection for the current 15 minute interval, above which an alarm is generated.
Total ESs Threshold	Threshold value for Errored Seconds detection for the 24-hour interval, above which an alarm is generated.
SESs Threshold	Severely Errored Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total SESs Threshold	Severely Errored Seconds threshold for the 24 hour interval, above which an alarm is generated.
SEFSs Threshold	Severely Errored Framing Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total SEFSs Threshold	Severely Errored Framing Seconds threshold for the 24 hour interval, above which an alarm is generated.
CVs Threshold	Coding Violations threshold for the current 15 minute interval, above which an alarm is generated.
Total CVs Threshold	Coding Violations threshold for the 24 hour interval, above which an alarm is generated.
Section Alarm State	Current alarm status of the section.
Section Stat Alarm State	Indicates the section stat alarm status of the interface.

6.6.1.4 Configuring the Sonet Path Alarm

Step 1 Within the **Line Config** tab (see 6.6.1 Enabling SONET Lines for AXSM, page 6-34) choose the **Sonet Path Alarm** option from the **Category** drop-down arrow.

Figure 6-23 Configuration Center—AXSM Line Config Tab, Sonet Path Alarm Category



Note Table 6-19 describes fields in the AXSM Line Config tab, Sonet Path Alarm category.

Step 2 Choose the appropriate option from the **Alarm Severity** drop-down arrow. Input the other fields with data as desired.

Step 3 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Note The following thresholds are the same for Far End and Near End.

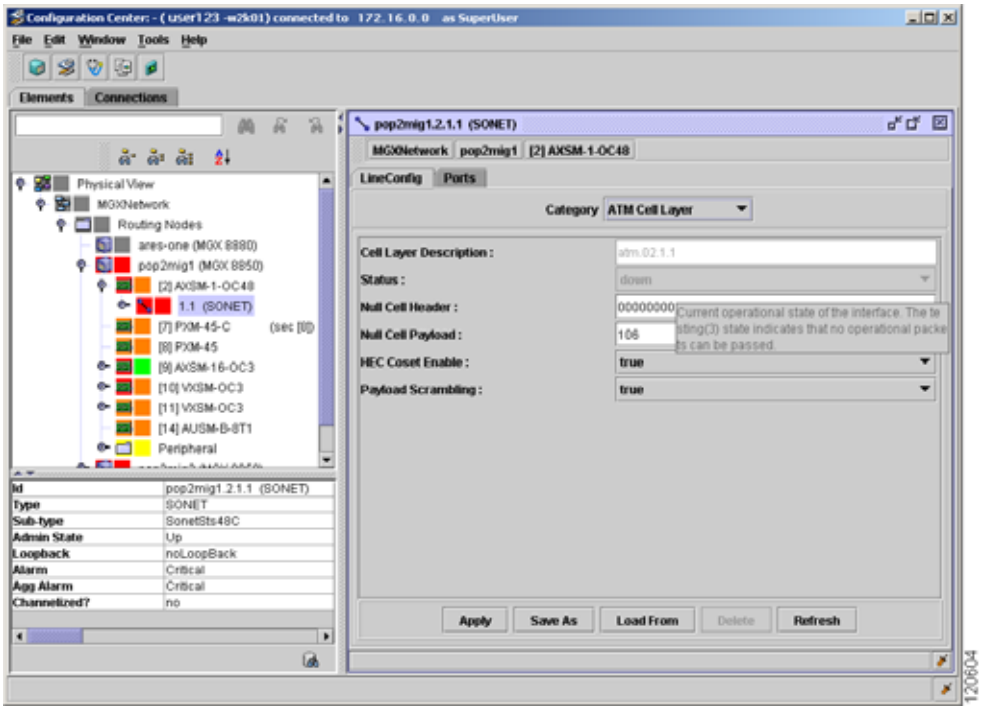
Table 6-19 Field Descriptions for the AXSM Line Config Tab, Sonet Path Alarm Category

Field Name	Description
Alarm Severity	Setting this option to major or minor raises a corresponding severity alarm when any statistical threshold is exceeded. By default, TCA crossing does not raise any alarm. For alarm severity definitions, see Chapter 9, "Managing Faults."
ESs Threshold	Threshold value for Errored Seconds (ES) detection for the current 15 minute interval, above which an alarm is generated. This threshold is the same for Far End and Near End.
Total ESs Threshold	Threshold value for Errored Seconds detection for the 24-hour interval, above which an alarm is generated.
SESs Threshold	Severely Errored Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total SESs Threshold	Severely Errored Seconds threshold for the 24 hour interval, above which an alarm is generated.
CVs Threshold	Coding Violations threshold for the current 15 minute interval, above which an alarm is generated.
Total CVs Threshold	Coding Violations threshold for the 24 hour interval, above which an alarm is generated.
UASs Threshold	Unavailable Seconds threshold for the current 15 minute interval, above which an alarm is generated.
Total UASs Threshold	Unavailable Seconds threshold for the 24 hour interval, above which an alarm is generated.
Path Alarm State	Current alarm status of the path.
Path Stat Alarm State	Indicates the path stat alarm status of the interface.

6.6.1.5 Configuring the ATM Cell Layer

Step 1 Within the **Line Config** tab (see 6.6.1 Enabling SONET Lines for AXSM, page 6-34) choose the **ATM Cell Layer** option from the **Category** drop-down arrow.

Figure 6-24 Configuration Center—AXSM Line Config Tab, ATM Cell Layer Category



Note Table 6-20 describes fields in the AXSM Line Config tab, ATM Cell Layer category.

Step 2 Choose the appropriate options from the **HEC Coset Enable** and **Payload Scrambling** drop-down arrows.

Step 3 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-20 Field Descriptions for the AXSM Line Config Tab, ATM Cell Layer Category

Field Name	Description
Cell Layer Description	This string should include the name of the manufacturer, the product name, and the version of the hardware interface.
Status	Current operational state of the interface. The testing state indicates that no operational packets can be passed.
Null Cell Header	The first four bytes of the ATM header to be used for null cells.
Null Cell Payload	Null cell payload definition. The default value is 106 (0x6A).
HEC Coset Enable	If enabled, the algorithm of Coset Polynomial Addition is applied to do header error check calculations. It applies to transmitted as well as received cells.
Payload Scrambling	Indicates whether payload scrambling is enabled.

6.6.2 Enabling DS1 Lines for AXSM

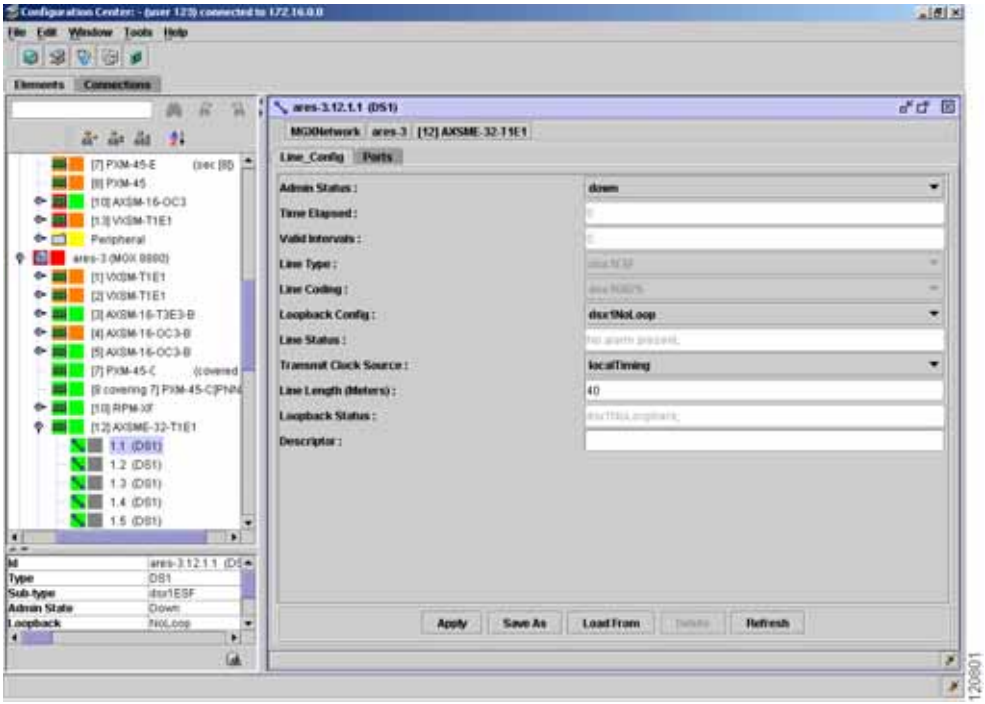
Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click an AXSM (T1E1) card.

Step 3 Click the **Lines** tab. Click on the line you want to enable, then click **Details**. The **Line Config** tab appears.

Note For details on the Ports tab, see section 6.6.5 Creating a Port for AXSM, page 6-55.

Figure 6-25 Configuration Center—AXSM DS1 Line Config Tab



Step 4 Choose the **Up** option from the **Admin Status** drop-down arrow.

Step 5 (Optional) Verify or modify additional fields, as desired.

Note Table 6-21 describes fields in the AXSM DS1 Line Config tab.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-21 Field Descriptions for the AXSM DS1 Line Config Tab

Field Name	Description
Admin Status	Desired state of the interface.
Time Elapsed	Number of seconds that have elapsed since the beginning of the near end current error measurement period.
Valid Intervals	Number of previous near end intervals for which data was collected.
Line Type	Configured line type.
Line Coding	Type of zero code suppression used on this interface.
Loopback Config	Desired loopback configuration.
Line Status	Line status of interface.
Transmit Clock Source	Source of transmit clock.

Table 6-21 Field Descriptions for the AXSM DS1 Line Config Tab (continued)

Field Name	Description
Line Length (meters)	Length of the DS1 line. Only useful if the interface has configurable line build out circuitry.
Loopback Status	Current state of loopback on the DS1 interface.
Descriptor	Line descriptor.

6.6.3 Enabling DS3 Lines for AXSM

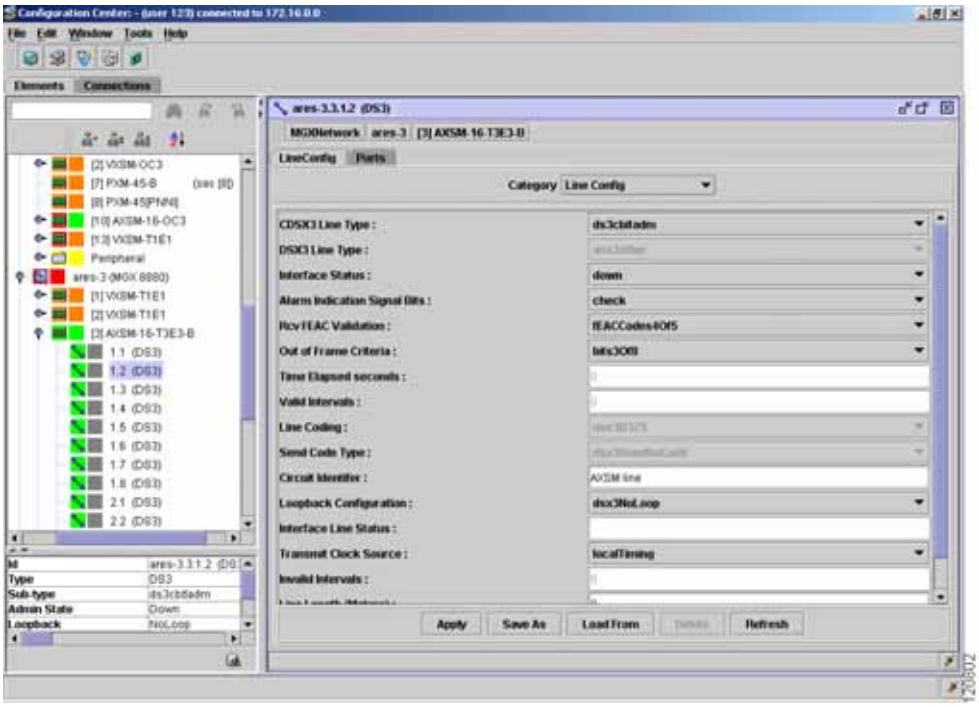
Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click an AXSM (T3E3) card.

Step 3 Click the **Lines** tab. Click on the line you want to enable, then click **Details**. The **Line Config** tab appears, with the **Line Config** category selected by default.

Note For details on the Ports tab, see section 6.6.5 Creating a Port for AXSM, page 6-55.

Figure 6-26 Configuration Center—AXSM DS3 Line Config Tab, Line Config Category



Step 4 Choose the **Up** option from the **Interface Status** drop-down arrow.

Step 5 (Optional) Verify or modify additional fields, as desired.

Note Table 6-22 describes fields in the AXSM DS3 Line Config tab, Line Config category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-22 Field Descriptions for the AXSM DS3 Line Config Tab, Line Config Category

Field Name	Description
CDSX3 Line Type	Type of DS3 C-bit or E3 application implementing this interface.
DSX3 Line Type	Type of DS3 C-bit or E3 application implementing this interface.
Interface Status	State of the interface.
Alarm Indication Signal Bits	When check is set, the Alarm Indication Signal (AIS) is declared when “1010...”b is found and C-bits are all zero. When ignore is set, an AIS condition is declared when “1010...”b is detected irrespective of the state of the C-bits.
Rcv FEAC Validation	Specifies the Far End Alarm and Control (FEAC) code validation criteria.
Out of Frame Criteria	Specifies the Out of Frame decision criteria.
Time Elapsed Seconds	Number of seconds that have elapsed since the beginning of the near end current error measurement period.
Valid Intervals	Number of previous near end intervals for which data was collected. This value will be 96 unless the interface was brought online within the last 24 hours, in which case the value will be the number of complete 15 minute near end intervals since the interface has been online.
Line Coding	Type of zero code suppression used on this interface.
Send Code Type	Type of code that is being sent across the DS3/E3 interface by the device.
Circuit Identifier	Variable contains the transmission vendor’s circuit identifier, to facilitate troubleshooting.
Loopback Configuration	Represents the desired loopback configuration of the DS/E3 interface. dsx3NoLoop means not in the loopback state. Additional values include: • dsx3PayLoadLoop • dsx3LineLoop • dsx3OtherLoop • dsx3InwardLoop • dsx3DualLoop
Interface Line Status	Line status of the interface.
Transmit Clock Source	Source of the transmit clock.

Table 6-22 Field Descriptions for the AXSM DS3 Line Config Tab, Line Config Category (continued)

Field Name	Description
Invalid Intervals	Number of intervals in the range from 0 to dsx3ValidIntervals for which no data is available.
Line Length (meters)	Length of the DS3 line.
Descriptor	Line descriptor.

6.6.3.1 Setting Up Statistical Alarm Severity

Step 1 Within the AXSM DS3 **Line Config** tab (for details, see 6.6.3 Enabling DS3 Lines for AXSM, page 6-47) select the **15 Min Alarm Config** option in the **Category** drop-down arrow.

Step 2 Choose the **Statistical Alarm Severity** level from the drop-down arrow. Values include:

- **none**
- **minor**
- **major**

Step 3 Configure additional fields as desired.

Note Table 6-23 describes fields in the AXSM DS3 Line Config tab, 15 Min Alarm Config category.

Step 4 Click **Apply** to set up the statistical alarm severity.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-23 Field Descriptions for the AXSM DS3 Line Config Tab, 15 Min Alarm Config Category

Field Name	Description
Statistical Alarm Severity	Sets up the severity of any of the statistical alarms.
DS3 Line Statistics Alarm	Bitmap of the DS3 line statistical alarms.

Table 6-23 Field Descriptions for the AXSM DS3 Line Config Tab, 15 Min Alarm Config Category (continued)

Field Name	Description
15 Min LCV Threshold	If this value is exceeded in a 15 minute window, a statistical alarm will be declared.
15 Min LES Threshold	
15 Min PCV Threshold (only for T3)	
15 Min PES Threshold (only for T3)	
15 Min PSES Threshold (only for T3)	
15 Min SEFS Threshold	
15 Min UAS Threshold	
15 Min CCV Threshold (only for T3)	
15 Min CES Threshold (only for T3)	
15 Min CSES Threshold (only for T3)	

6.6.3.2 Setting Up the DSX3 24 Hour Alarm

Step 1 Within the AXSM DS3 **Line Config** tab (for details, see 6.6.3 Enabling DS3 Lines for AXSM, page 6-47) choose the **Dsx3 24 Hr Alarm Config** option from the **Category** drop-down arrow.

Step 2 Configure fields as desired.

Note Table 6-24 describes fields in the AXSM DS3 Line Config tab, Dsx3 24 Hr Alarm Config category.

Step 3 Click **Apply** to set up the DSX3 24 hour alarm configuration.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-24 Field Descriptions for the AXSM DS3 Line Config Tab, Dsx3 24 Hr Alarm Config Category

Field Name	Description
24 Hr LCV Threshold	If this value is exceeded in a sliding 24 hour window, a statistical alarm will be declared. The threshold is checked every 15 minutes for the preceding 24 hour interval.
24 Hr LES Threshold	
24 Hr PCV Threshold (only for T3)	
24 Hr PES Threshold (only for T3)	
24 Hr PSES Threshold (only for T3)	
24 Hr SEFS Threshold	
24 Hr UAS Threshold	
24 Hr CCV Threshold (only for T3)	
24 Hr CES Threshold (only for T3)	
24 Hr CSES Threshold (only for T3)	

6.6.3.3 Setting Up the ATM Cell Layer

Step 1 Within the AXSM DS3 **Line Config** tab (for details, see 6.6.3 Enabling DS3 Lines for AXSM, page 6-47) choose the **ATM Cell Layer** option from the **Category** drop-down arrow.

Step 2 Configure fields as desired.

Note Table 6-25 describes fields in the AXSM DS3 Line Config tab, ATM Cell Layer category.

Step 3 Click **Apply** to set up the ATM cell layer configuration.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-25 Field Descriptions for the AXSM DS3 Line Config Tab, ATM Cell Layer Category

Field Name	Description
Cell Layer Description	This string should include the name of the manufacturer, the product name and the version of the hardware interface.
Status	Current operational state of the interface. The testing state indicates that no operational packets can be passed.
Null Cell Header	First four bytes of the ATM header to be used for null cells.
Null Cell Payload	Null cell payload definition. Default value is 0x6A.
HEC Coset Enable	If set to true, the algorithm of Coset Polynomial Addition is applied to perform header error check calculations. Applies to transmitted and received cells.
Payload Scrambling	Indicates whether payload scrambling is enabled or not.

6.6.3.4 Setting Up the Plcp Statistical Alarm Severity

Step 1 Within the AXSM DS3 **Line Config** tab (for details, see 6.6.3 Enabling DS3 Lines for AXSM, page 6-47) choose the **Plcp Alarm** option from the **Category** drop-down arrow.

Step 2 Choose the **Plcp Statistical Alarm Severity** level from the drop-down arrow. Values include:

- **none**
- **minor**
- **major**

Step 3 Configure additional fields as desired.

Note Table 6-26 describes fields in the AXSM DS3 Line Config tab, Plcp Alarm category.

Step 4 Click **Apply** to set up the Plcp statistical alarm severity.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-26 Field Descriptions for the AXSM DS3 Line Config Tab, Plcp Alarm Category

Field Name	Description
Plcp Statistical Alarm Severity	Severity of PLCP statistical alarm.
15 Min BIP8Cv Threshold	If this value is exceeded in a 15 minute or sliding 24 hour window, a statistical alarm will be declared.
24 Hr BIP8Cv Threshold	
15 Min BIP8ES Threshold	
24 Hr BIP8ES Threshold	
15 Min BIP8SES Threshold	
24 Hr BIP8SES Threshold	
15 Min BIP8SEFS Threshold	
24 HR BIP8SEFS Threshold	
15 Min BIP8UAS Threshold	
24 Hr BIP8UAS Threshold	
Plcp Line Alarm Status	Bitmap of the DS3 line alarms.
Plcp Line Stat Alarm State	Bitmap of the DS3 Plcp line statistical alarms.

6.6.4 Creating or Modifying AXSM Sonet Line APSs

You can configure the SONET line to have Automatic Protection Switching (APS). SRM or AXSME cards can be configured for APS.

If you are setting up APS on multiple cards, you must first set up an APS connector and then set up redundancy on the node (for details on setting up redundancy, see 5.5.1 Configuring Card Redundancy, page 5-49.)

Note This tab is only applicable for OC-type AXSM cards, and not T3 or T1-type AXSM cards.

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Double-click an AXSM card.

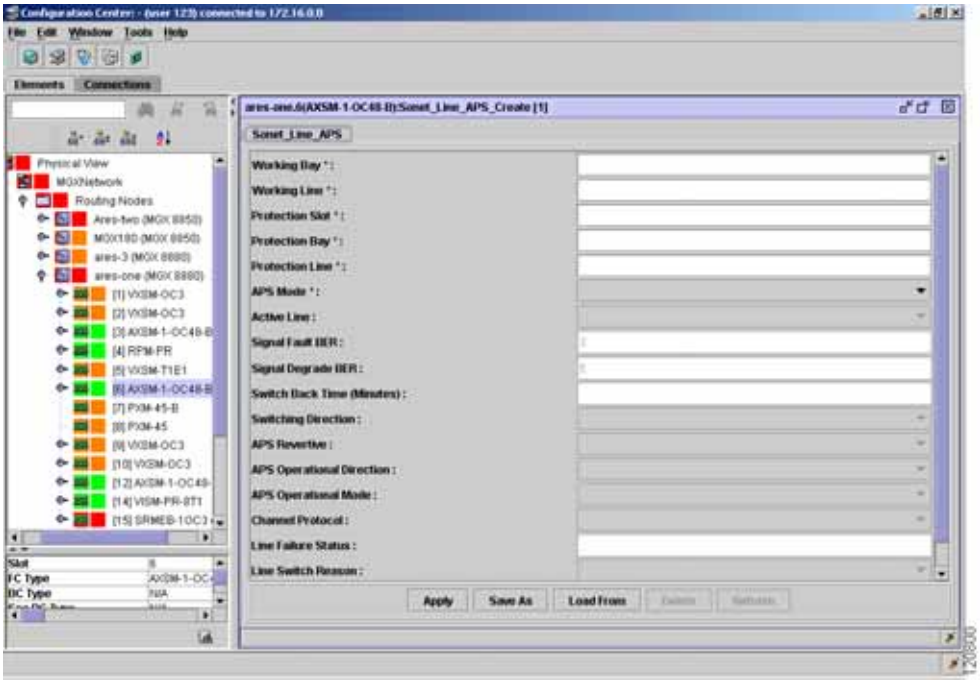
Step 3 Click the AXSM **Sonet Line APS** tab. Within the Sonet Line APS tab, you can:

a. Click **Create** to create a new Sonet Line APS

or

b. Select the line you want to modify, then click **Details**

Figure 6-27 Configuration Center—AXSM Sonet Line APS Tab



Step 4 Configure the fields.

Step 5 Click **Apply** to save any changes.

Note Table 6-27 describes fields in the AXSM Sonet Line APS tab.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-27 Field Descriptions for the AXSM Sonet Line APS Tab

Field Name	Description
Working Bay	Working bay number.
Working Line	Working line number.
Protection Slot	Protection slot number.
Protection Bay	Protection bay number.
Protection Line	Protection line number.

Table 6-27 Field Descriptions for the AXSM Sonet Line APS Tab (continued)

Field Name	Description
APS Mode	Configures APS architecture mode on the working/protection line pairs.
Active Line	Indicates which line is active.
Signal Fault BER	Contains the bit error rate threshold for signal fault detection on the working line.
Signal Degrade BER	Contains the bit error rate threshold for signal degrade detection on the working line.
Switch Back Time (minutes)	Contains interval (in minutes) to wait before attempting to switch back to the working line.
Switching Direction	Configures the switching direction supported by this APS line.
APS Revertive	Configures the APS revertive or non-revertive option.
APS Operational Direction	Shows the actual APS direction that is implemented on the Near End terminal.
APS Operational Mode	Shows the actual APS architecture mode that is implemented on the Near End terminal.
Channel Protocol	Allows configuration of APS channel protocol to be implemented at the Near End terminal.
Line Failure Status	APS line failure status.
Line Switch Reason	APS line switch reason.
Working Section	Indicates which working section is the APS primary section.

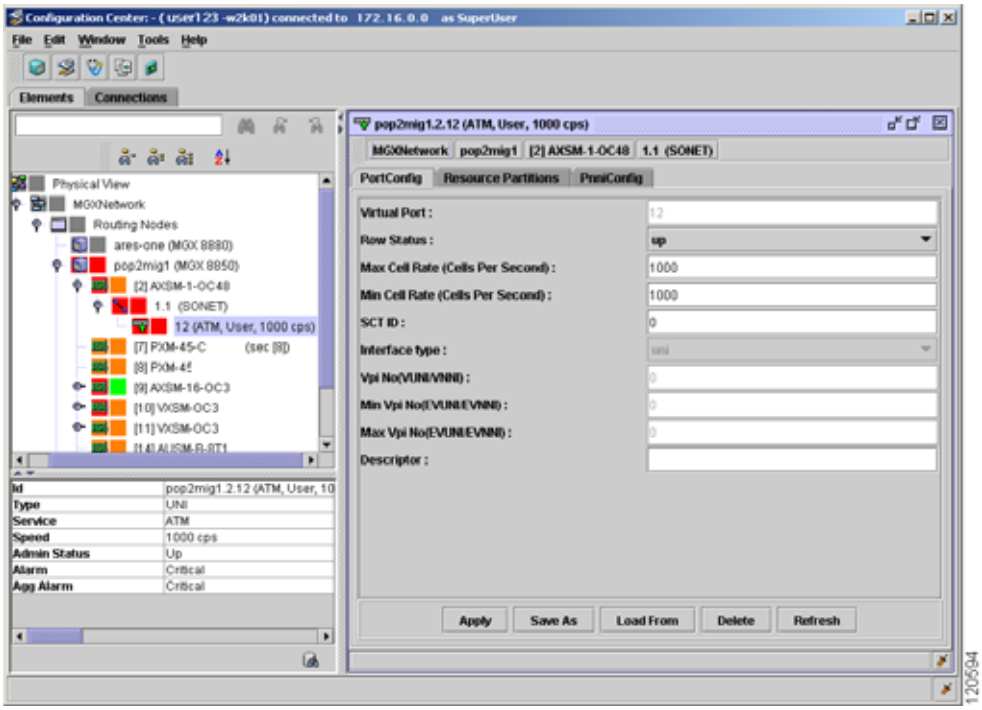
6.6.5 Creating a Port for AXSM

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, and expand the AXSM card. Double-click the line you want to create a port under.

Step 3 Click the **Ports** tab, then click **Create**. The **Port Config** tab appears.

Figure 6-28 Configuration Center—AXSM Port Config Tab



Step 4 Complete the active fields as desired.

Note Table 6-28 describes fields in the AXSM Port Config tab.

Step 5 Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-28 Field Descriptions for the AXSM Port Config Tab

Field Name	Description
Virtual Port	Unique value for the ATM virtual interface.
Row Status	Status of the row.
Max Cell Rate	ATM virtual interface's max cell rate.
Min Cell Rate	ATM virtual interface's guaranteed cell rate.
SCT ID	ID of the file that holds module-specific configuration parameters for this ATM virtual interface.

Table 6-28 Field Descriptions for the AXSM Port Config Tab (continued)

Field Name	Description
Interface Type	Type of ATM virtual interface that can be configured within a physical interface. Values include: • uni • nni • vnni • vuni • evuni • evnni
Vpi No (VUNI/VNNI)	Vpi number.
Min Vpi No (EVUNI/EVNNI)	Minimum Vpi number.
Max Vpi No (EVUNI/EVNNI)	Maximum Vpi number.
Descriptor	Port descriptor.

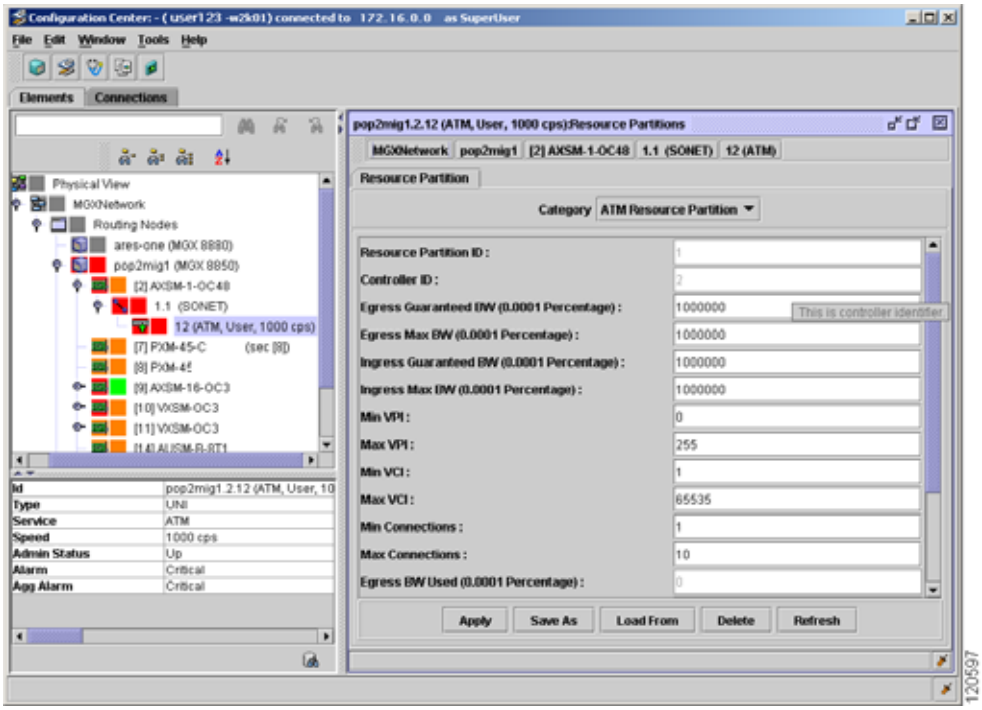
6.6.6 Creating a Resource Partition for AXSM

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, the AXSM card, and the AXSM line. Double-click the port you want to create a resource partition on.

Step 3 Click the **Resource Partitions** tab, then click **Create**.

Figure 6-29 Configuration Center—AXSM Resource Partitions Tab, ATM Resource Partition Category



Step 4 Input or modify the data as desired, then click **Apply**.

Note Table 6-29 describes fields in the AXSM Resource Partitions tab, ATM Resource Partition category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-29 Field Descriptions for the AXSM Resource Partitions Tab, ATM Resource Partition Category

Field Name	Description
Resource Partition ID	Resource partition identifier.
Controller ID	Controller identifier.
Egress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in egress direction. Range is 0 to 1000000.
Egress Max BW	Maximum percentage bandwidth for the resource partition in egress direction. Range is 0 to 1000000.
Ingress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in ingress direction. Range is 0 to 1000000.

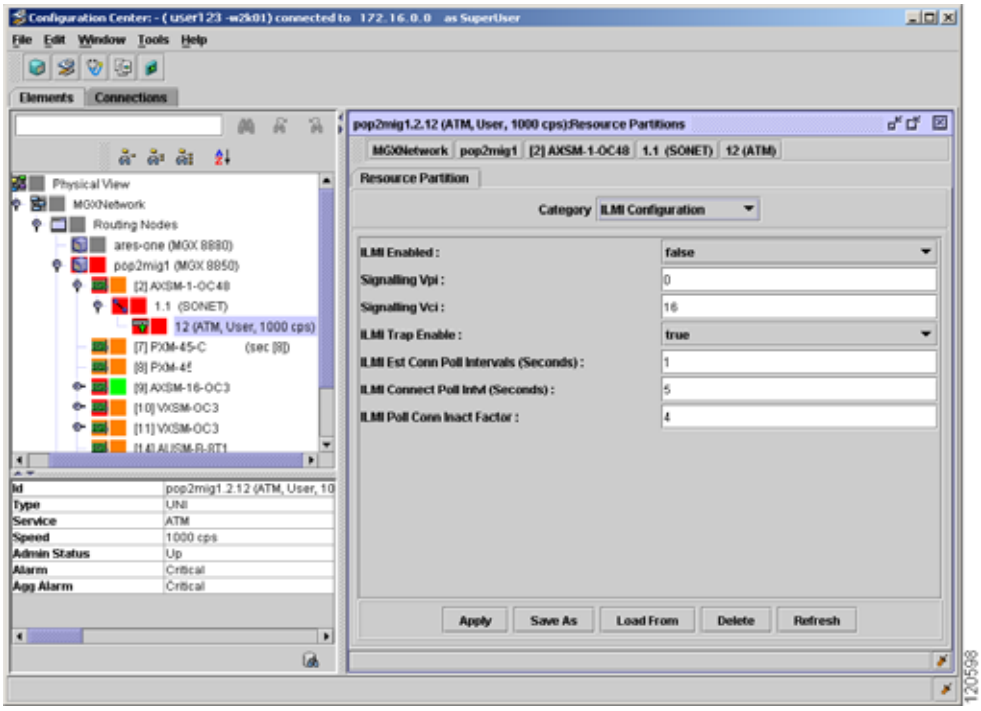
Table 6-29 Field Descriptions for the AXSM Resource Partitions Tab, ATM Resource Partition Category (continued)

Field Name	Description
Ingress Max BW	Maximum percentage bandwidth for the resource partition in ingress direction. Range is 0 to 1000000.
Min VPI	Beginning of the VPI range for this partition.
Max VPI	End of the VPI range for this partition.
Min VCI	Beginning of the VCI range for this partition.
Max VCI	End of the VCI range for this partition.
Min Connections	Guaranteed number of connections that can be configured on this partition.
Max Connections	Maximum number of connections that can be configured on this partition.
Egress BW Used	Percentage bandwidth used by the resource partition in egress direction.
Egress BW Avail	Percentage bandwidth available on the resource partition in egress direction.
Ingress BW Used	Percentage bandwidth used by the resource partition in ingress direction.
Ingress BW Avail	Percentage bandwidth available on the resource partition in ingress direction.
Used Connections	Number of connections currently in use on this partition.
Avail Connections	Number of connections available that can be added on this partition.

6.6.6.1 Modifying ILMI Configuration

Step 1 Within the AXSM **Resource Partitions** tab (see 6.6.6 Creating a Resource Partition for AXSM, page 6-57) choose the **ILMI Configuration** option from the **Category** drop-down arrow.

Figure 6-30 Configuration Center—AXSM Resource Partitions Tab, ILMI Configuration Category



Step 2 Choose the appropriate options from the **ILMI Enabled** and **ILMI Trap Enable** drop-down arrows, and modify data as desired. Click **Apply**.

Note Table 6-30 describes fields in the AXSM Resource Partitions tab, ILMI Configuration category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-30 Field Descriptions for the AXSM Resource Partitions Tab, ILMI Configuration Category

Field Name	Description
ILMI Enabled	Indicates if ILMI signalling is enabled or disabled.
Signalling Vpi	Vpi on which signalling cells arrive.
Signalling Vci	Vci on which signalling cells arrive.
ILMI Trap Enable	Indicates if ILMI trap generation is enabled or disabled.

Table 6-30 Field Descriptions for the AXSM Resource Partitions Tab, ILMI Configuration Category (continued)

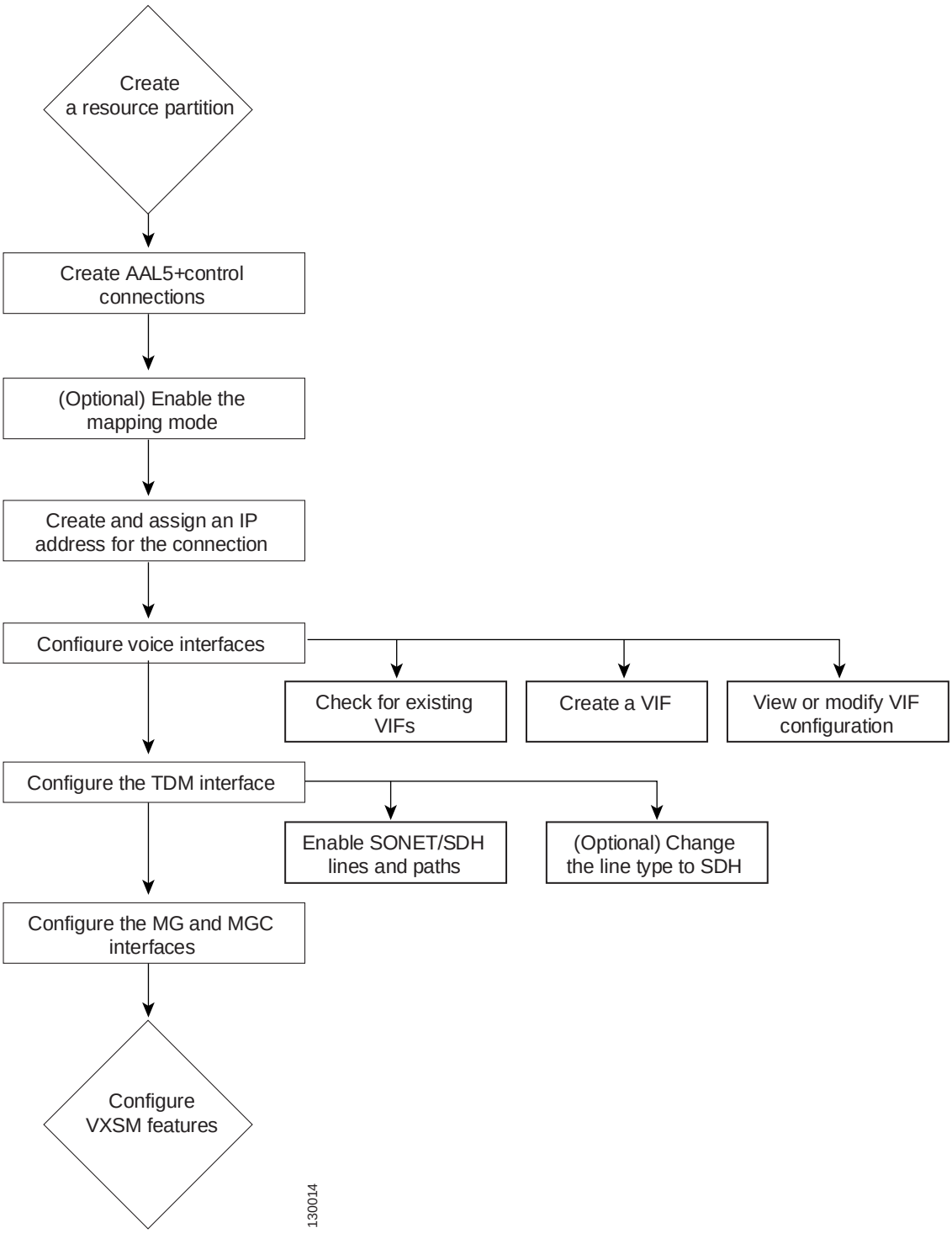
Field Name	Description
ILMI Est Conn Poll Intervals	Time S between successive transmissions of ILMI messages on this interface for the purpose of detecting establishment of ILMI connectivity.
ILMI Connect Poll Intvl	Time T between successive transmissions of ILMI messages on this interface for the purpose of detecting loss of ILMI connectivity.
ILMI Poll Conn Inact Factor	Number K of consecutive polls on this interface for which no ILMI response message is received before ILMI connectivity is declared lost.

6.7 How Do I Configure VXSM Cards?

Tip For more detailed information on VXSM configuration, refer to the *Cisco Voice Switch Services (VXSM) Configuration Guide and Command Reference for MGX Switches and Media Gateways, Release 5*.

The Cisco MGX 8880 and 8850 support the Voice Switch Service Module (VXSM) card, which functions as a media gateway (MG) and can be configured to meet the requirements of a variety of applications. For Voice over IP (VoIP) switching applications, the voice Time Division Multiplexed (TDM) interface, packet network interface, and the interface to the media gateway controller (MGC or call agent must be configured.

Figure 6-31 Process for Configuring VXSM Cards



To configure VXSM cards, you must perform the following steps:

Step 1 Create a resource partition—See 6.7.1 Creating a Resource Partition for VXSM, page 6-63.

Step 2 Create AAL5+control VXSM connections—See Chapter 7, "Provisioning Connections."

Step 3 (Optional, for OC3 cards only) Enable the mapping mode—See 6.7.2 Enabling the Mapping Mode for VXSM, page 6-65

Step 4 Create and assign an IP address for the connection—See 6.7.3 Creating and Assigning an IP Address for the Connection, page 6-66.

Step 5 Configure the TDM interface—See 6.7.4 Configuring the Time-Division Multiplexing Interface for VXSM, page 6-67.

Step 6 Configure voice interfaces (VIs)—See 6.7.5 Configuring Voice Interfaces, page 6-74.

Step 7 Configure the Media Gateway (MG) and Media Gateway Controller (MGC) interface using H.248 or XGCP protocol—See 6.7.6 Configuring MG-MGC Interfaces, page 6-77.

Step 8 (Optional) Configure VXSM features—See 6.7.7 How Do I Configure VXSM Features?, page 6-101.

6.7.1 Creating a Resource Partition for VXSM

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VXSM card.

Step 3 Click the **Port** tab to display the entries of the port table.

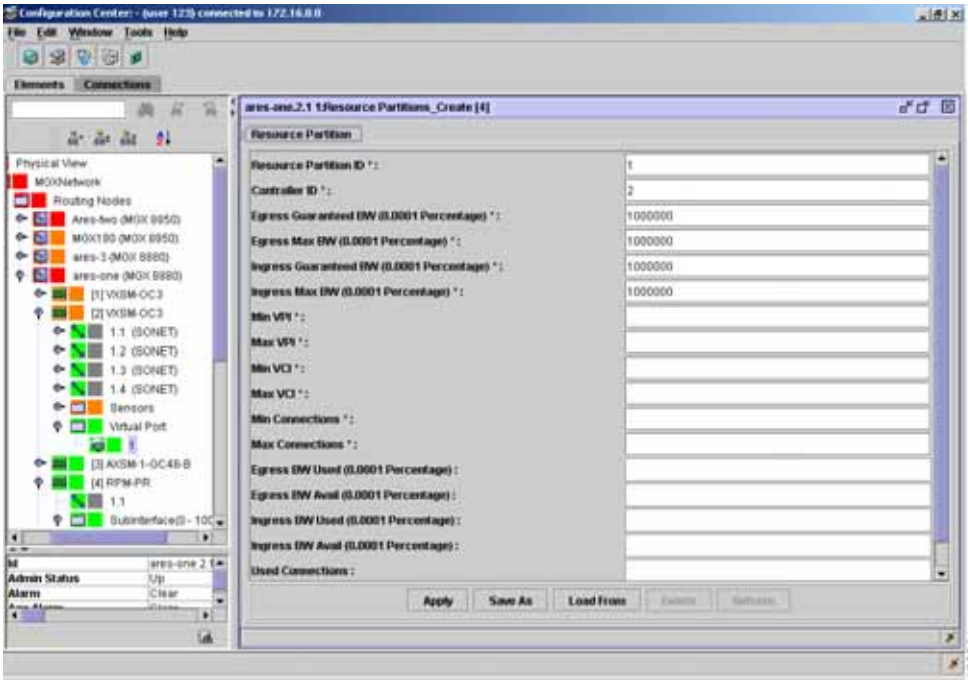
Step 4 Select the port entry.

Step 5 Click **Details**.

Step 6 Click the **Resource Partitions** tab to display the resource partitions table.

Step 7 Click **Create**. The Create Resource Partitions window appears.

Figure 6-32 Configuration Center—VXSM Create Resource Partitions Window



Step 8 Configure the fields.

Note Table 6-31 describes fields in the VXSM Create Resource Partitions window.

Step 9 Click **Apply** to create the resource partition.

Table 6-31 Field Descriptions for the VXSM Create Resource Partitions Window

Field Name	Description
Resource Partition ID	Value for the resource partition identifier. The range is from 1-10. The value 1 is reserved for PNNI.
Controller ID	Value for the controller identifier. The range is from 2-255. The value 2 is reserved for PNNI.
Egress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in egress direction. The range is from 0-1000000.
Egress Max BW	Maximum percentage bandwidth for the resource partition in egress direction. The range is from 0-1000000.
Ingress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in ingress direction. The range is from 0-1000000.
Ingress Max BW	Maximum percentage bandwidth for the resource partition in ingress direction. The range is from 0-1000000.

Table 6-31 Field Descriptions for the VXSM Create Resource Partitions Window (continued)

Field Name	Description
Min VPI	Beginning of the VPI range for this partition. For RPM VCC partitions, the range is 0-0. For RPM VPC partitions, the range is 1-255. For VXSM, the range is 0-255.
Max VPI	End of the VPI range for this partition. For RPM VCC partitions, the range is 0-0. For RPM VPC partitions, the range is 1-255. For VXSM, the range is 0-255.
Min VCI	Beginning of the VCI range for this partition. For VXSM, the range is 1-65535.
Max VCI	End of the VCI range for this partition. For VXSM, the range is 1-65535.
Min Connections	Guaranteed number of connections that can be configured on this partition. For VXSM, the range is 1-8100.
Max Connections	Maximum number of connections that can be configured on this partition. For VXSM, the range is 1-8100.
Egress BW Used	Percentage bandwidth used by the resource partition in egress direction.
Egress BW Avail	Percentage bandwidth available on the resource partition in egress direction.
Ingress BW Used	Percentage bandwidth used by the resource partition in ingress direction.
Ingress BW Avail	Percentage bandwidth available on the resource partition in ingress direction.
Used Connections	Number of connections currently in use on this partition.
Avail Connections	Number of connections available that can be added on this partition.

6.7.2 Enabling the Mapping Mode for VXSM

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VXSM card.

Step 3 Click the **Media Gateway** tab. The **Gateway Capabilities** category appears by default.

Step 4 Set the **VT Mapping Mode** to **standard** or **titan**.

Note Table 6-33 describes fields in the VXSM Media Gateway tab, Gateway Capabilities category.

For additional information on this field, refer to the *Cisco Voice Switch Services (VXSM) Configuration Guide and Command Reference for MGX Switches and Media Gateways, Release 5*.

Step 5 Click **Apply** to enable the mapping mode.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-32 Field Descriptions for the VXSM Media Gateway Tab, Gateway Capabilities Category

Field Name	Description
Gateway Domain Name	Domain name under which the media gateway could also be registered in a DNS name server.
VT Mapping Mode	Represents the VT mapping mode, which can be either: • standard—standard mapping mode • titan—Titan 5500 mapping mode. Only valid if SONET line medium type is SONET and SONET path payload type is VT1.5.
Total Number of DSPs	Total number of DSPs in the card.

6.7.3 Creating and Assigning an IP Address for the Connection

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

Step 3 Click the **Media Gateway** tab.

Step 4 Choose the **PVC IP Address** option from the **Category** drop-down arrow.

Step 5 Click **Create** to display the Create PVC IP Address window.

Step 6 Complete the fields. Make sure to use the same VPI/VCI combination entered when you created the connection.

Note Table 6-33 describes fields in the VXSM Create PVC IP Address window.

Step 7 Click **Apply** to add the IP address for the connection.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-33 Field Descriptions for the VXSM Create PVC IP Address Window

Field Name	Description
Index	A unique index to identify each media gateway IP address.
Interface	Virtual port associated to the media gateway IP address.
VPI	Represents the VPI of the PVC associated to the IP address.
VCI	Represents the VCI of the PVC associated to the IP address.
IP Address	Configured IP address of the media gateway.

Table 6-33 Field Descriptions for the VXSM Create PVC IP Address Window (continued)

Field Name	Description
Prefix Length	Specifies the number of leading one bits which from the mask to be logical and-ed with the media gateway address before being compared to the value in the cmgwIpCofigAddress.
IP Address Type	IP address type.
Default Gateway IP	Specifies the IP address of the entry will become the default gateway address.

6.7.4 Configuring the Time-Division Multiplexing Interface for VXSM

The TDM network consists of a number of DS1s that each contain DS0 voice circuits, which interface with the VXSM card either through the 4-port OC-3 back card or the 24-port T1/E1 back card.

These tasks describe how to configure the TDM interface:

Step 1 (Optional) Change the line type to SDH (by default, the line type is set to SONET)—See 6.7.4.1 Changing the VXSM Line Type to SDH, page 6-67.

Step 2 Enable SONET lines and paths—See 6.7.4.2 Enabling SONET Lines and Paths for VXSM, page 6-69

or

Enable SDH lines and paths—See 6.7.4.3 Enabling SDH Lines and Paths for VXSM, page 6-73.

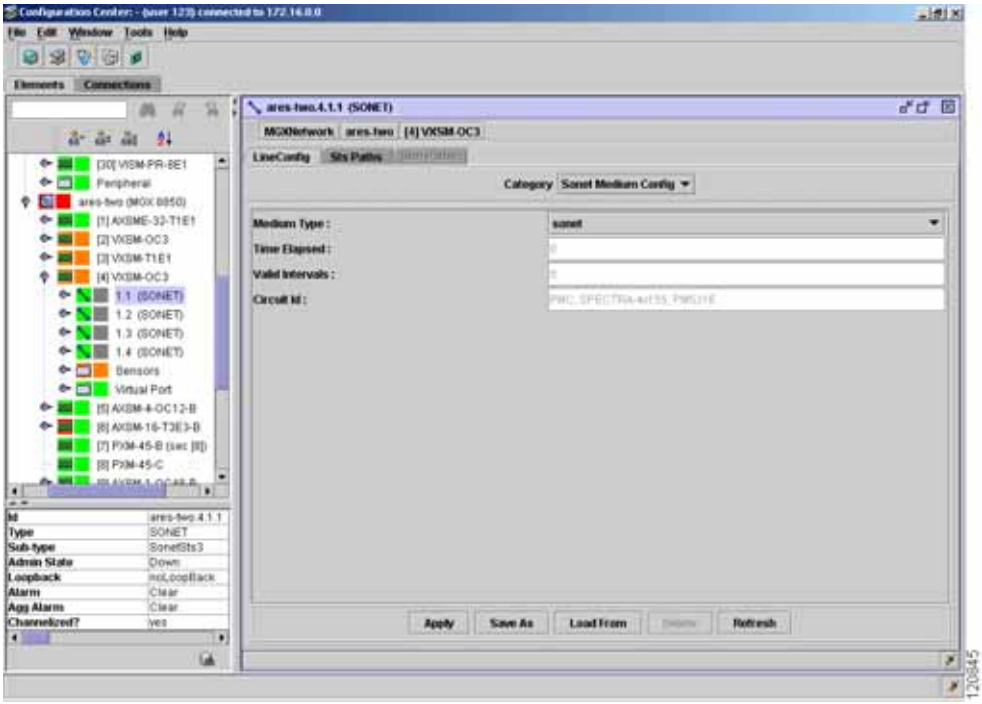
6.7.4.1 Changing the VXSM Line Type to SDH

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, expand the VXSM card, and double-click on the first VXSM line. The Line Config tab appears.

Step 3 Choose the **Sonet Medium Config** option from the **Category** drop-down arrow.

Figure 6-33 Configuration Center—VXSM Line Config Tab, Sonet Medium Config Category



Step 4 In the **Medium Type** field, click on the drop-down arrow to choose **SDH**.

Note Table 6-34 describes fields in the VXSM Line Config tab, Sonet Medium Config category.

Step 5 Click **Apply** to change the line type to SDH.

Note Changing the line type to SDH on the first line trickles down to the other lines.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-34 Field Descriptions for the VXSM Line Config Tab, Sonet Medium Config Category

Field Name	Description
Medium Type	Identifies whether a SONET or SDH signal is used across the interface.
Time Elapsed	Number of seconds (including partial seconds) elasped since the beginning of the current measurement period.

Table 6-34 Field Descriptions for the VXSM Line Config Tab, Sonet Medium Config Category (continued)

Field Name	Description
Valid Intervals	Number of previous 15 minute intervals for which data was collected.
Circuit ID	The transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting. **Note** The circuit identifier, if available, is also represented by ifPhysAddress.

6.7.4.2 Enabling SONET Lines and Paths for VXSM

If you are using SONET, you must enable the lines and paths in the following order:

1. SONET line
2. STS path
3. DS1/E1 line

Perform the following steps:

Step 1 Enable the SONET line:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, double-click the VXSM OC3 card.

c. Click the **Lines** tab.

d. Click the SONET line that you want to enable, then click **Details**. The Line Config tab appears, with the Sonet Line Config category selected by default.

e. From the **Enable** drop-down arrow, choose the **up** option to enable the SONET line.

Note Table 6-35 describes fields in the VXSM Line Config tab, Sonet Line Config category.

f. Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Step 2 Enable the STS path:

a. Under the **Elements** tab, within the node, expand the VXSM OC3 card, then double-click on the SONET line that contains the STS path you want to enable.

b. Click the **STS Paths** tab.

c. Click the STS path that you want to enable, then click **Details**. The Path Config tab appears, with the Paths category selected by default.

d. (Optional) Change the channelization type to DS3, DS1, or E1 in the **Path Payload** field.

e. From the **Enable** drop-down arrow, choose the **up** option to enable the STS path.

Note Table 6-36 describes fields in the VXSM Path Config tab, Paths category.

f. Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Step 3 Enable the DS1/E1 line:

a. Under the **Elements** tab, within the node, expand the VXSM OC3 card and expand the SONET line, STS path, and VT path that contain the DS1/E1 line you want to enable. Double-click on the DS1/E1 line. The DS1/E1 Path tab appears, with the DS1/E1 Line Info option selected by default.

b. From the **Admin Status** drop-down arrow, choose the **up** option to enable the STS path.

Note Table 6-37 describes fields in the VXSM DS1/E1 Path tab, DS1/E1 Line Info category.

c. Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-35 Field Descriptions for the VXSM Line Config Tab, Sonet Line Config Category

Field Name	Description
Speed (Mbps)	An estimate of the interface's current bandwidth in units of 1,000,000 bits per second.
Enable	Desired state of the interface: • **up**—enables the line • **down**—disables the line
Loopback Type	Desired loopback mode configuration of the line: • **noLoopback**—Specifies no loopback state. • **lineLocal**—Signal sent at the line is looped back through the device. • **lineRemote**—Signal sent does not go through the device but is looped back out.
Clock Source	Specifies the source of the transmit clock.
Frame Scramble	Enables or disables the scrambling option in the line.
Line Type	Configured line type.
Descriptor	Line descriptor.

Table 6-35 Field Descriptions for the VXSM Line Config Tab, Sonet Line Config Category (continued)

Field Name	Description
RDIV Type	Specifies the type of Remote Defect Indication - Virtual Tributary/Container (RDI-V) sent by this NE to the remote NE. Values include: • onebit—(Default) specifies 1-bit RDIV • threebit—Specifies 3-bit enhanced RDIV
RDIP Type	Specifies the type of Remote Defect Indication - Path (RDI-P) sent by this NE to the remote NE. Values include: • onebit—(default) specifies 1-bit RDIP • threebit—Specifies 3-bit enhanced RDIP

Table 6-36 Field Descriptions for the VXSM Path Config Tab, Paths Category

Field Name	Description
Path Number	Path number.
Enable	Desired state of the interface: • **up**—enables the path • **down**—disables the path
Path Width	Value that indicates the type of SONET/SDH path. For SONET, the assigned types are the STS-Nc SPEs, where N=1, 3, 12, 24, 48, 192 and 768. STS-1 is equal to 51.84 Mbps. For SDH, the assigned types are the STM-Nc VCs, where N=1, 4, 16, 64, and 256.
Path Payload	Specifies the payload carried by the SONET/SDH path. Values are: • ds3 • vt15vc11 (DS1) • vt2vc12 (E1)
Path Status	Indicates the status of the interface.

Table 6-37 Field Descriptions for the VXSM DS1/E1 Path Tab, DS1/E1 Line Info Category

Field Name	Description
Admin Status	Desired state of the interface.
Time Elapsed	Number of seconds that have elapsed since the beginning of the near end current error measurement period.
Valid Intervals	Number of previous near end intervals for which data was collected.

Table 6-37 Field Descriptions for the VXSM DS1/E1 Path Tab, DS1/E1 Line Info Category (continued)

Field Name	Description
Line Type	Indicates the variety of DS1 line implementing this circuit. Values include: • For T1 interfaces only: – **dsx1ESF**—Extended SuperFrame DS1 (T1.107) – **dsx1D4**—AT&T D4 format DS1 (T1.107) • For E1 interfaces only: – **dsx1E1**—ITU-T Recommendation G.704 (Table 4a). – **dsx1E1CRC**—ITU-T Recommendation G.704 (Table 4b). – **dsx1E1MF**—G.704 (Table 4a) with TS16 multiframing enabled. – **dsx1E1CRCMF**—G.704 (Table 4b) with TS16 multiframing enabled. – **dsx1Unframed**—DS1 with No Framing – **dsx1E1Unframed**—E1 with No Framing (G.703) – **dsx1E1Q50**—ITU-T G.704, Table 14. – **dsx1E1Q50CRC**—E1Q50 with CRC.
Loopback Config	Desired loopback configuration of the DS1/E1 interface.
Line Status	Status of the line.
Transmit Clock Source	Source of transmit clock.
Loopback Status	Current loopback state on the DS1/E1 interface.
Send Code	Indicates what type of code is being sent across the DS1/E1 interface. Setting this variable causes the interface to send the code requested.
Signal Mode	Signal options used by the DS1 line for the media gateway. Values include: • **none**—indicates no bits are reserved for signaling on this channel. • **robbedBit**—indicates the DS1 Robbed Bit Signaling is in use. This option applies only to the T1 interface. • **messageOriented**—indicates that Common Channel Signaling (CCS) is used either on channel 16 of an E1 link or channel 24 of a DS1 link.
cds1 Loopback CodeDetection	Enables or disables the detection of far end loopback requests (inband or out-of-band ESF).
cds1 Repetition	Used to repeatedly apply the writable objects of dsx1ConfigTable and cds1ConfigTable specified in the same SNMP PDU starting from the row indicated by the index of the instance for the number of rows specified in this object.

6.7.4.3 Enabling SDH Lines and Paths for VXSM

If you are using SDH, you must enable the lines and paths in the following order:

1. SDH line
2. STM path
3. DS1/E1 line

Perform the following steps:

Step 1 Enable the SDH line:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, expand the VXSM OC3 card and double-click on the SDH line. The Line Config tab appears.

c. From the **Enable** drop-down arrow, choose the **up** option to enable the SDH line.

Step 2 Enable the STM path:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, expand the VXSM OC3 card and double-click on the AU-3 path. The Path Config tab appears.

c. From the **Enable** drop-down arrow, choose the **up** option to enable the STS path.

d. (Optional) From the **Tributary Grouping Type** drop-down arrow, choose one of the following options:

- **au3Grouping**—Channelization appears as follows: AU-3 > TU > DS1
- **au4Grouping**—Channelization appears as follows: AU-3 > TUG3 >TU > DS1

e. Click **Apply** to enable the STM path.

Step 3 Enable the DS1/E1 line:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, expand the VXSM OC3 card and double-click on the DS1/E1 line. The DS1/E1 Path tab appears.

c. From the **Admin Status** drop-down arrow, choose the **up** option to enable the DS1/E1 line.

6.7.5 Configuring Voice Interfaces

A voice interface (VIF) is a set of parameters applied to a group of DS0s within a DS1 in the TDM voice network. To configure voice interfaces, proceed as follows:

Step 1 Check to see if there are existing VIFs—See 6.7.5.1 Checking for Existing VIFs for VXSM, page 6-74.

If there are no existing VIFs, proceed to Step 2

or

if there are existing VIFs, skip Step 2.

Step 2 (Optional) Create a VIF—See 6.7.5.2 Creating a VIF for VXSM, page 6-74.

Step 3 (Optional) View or modify VIF configuration—See 6.7.5.3 Viewing or Modifying VIF Configuration, page 6-76.

6.7.5.1 Checking for Existing VIFs for VXSM

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, expand the VXSM card until you see the DS1 path you want to view VIFs under. Double-click the DS1 path. The DS1 Path tab appears.

Step 3 Choose **DSX0 Group** from the **Category** drop-down arrow. Any available VIFs appear in the table. To proceed, follow the steps in 6.7.5 Configuring Voice Interfaces, page 6-74.

6.7.5.2 Creating a VIF for VXSM

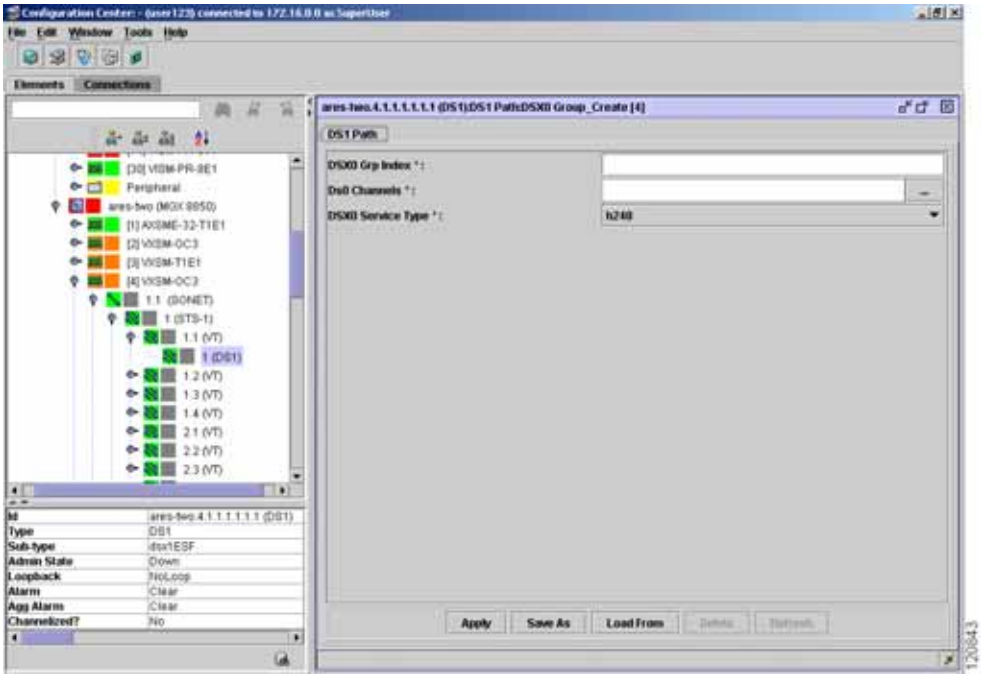
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, expand the VXSM card until you see the DS1 path you want to view VIFs under. Double-click the DS1 path. The DS1 Path tab appears.

Step 3 Choose **DSX0 Group** from the **Category** drop-down arrow.

Step 4 Click **Create**. The Create DSX0 Group window appears.

Figure 6-34 Configuration Center—VXSM Create DSX0 Group Window



Step 5 Configure the fields.

Note Table 6-38 describes the fields in the VXSM Create DSX0 Group window.

Step 6 Click **Apply** to add the VIF.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-38 Field Descriptions for the VXSM Create DSX0 Group Window

Field Name	Description
DSX0 Grp Index	Value that identifies the DS0 group in the T1/E1 interface. T1 range is 0-23; E1 range is 0-30.
DS0 Channels	Bitmap of the selected DS0 channels to be added into this group. T1 range is 1-24; E1 range is 1-31.
DSX0 Service Type	Specifies the service type of the CAS/DS0 group. Values include: • **xgcp—**specifies the xgcp (tgcp) protocol. • **h248**—specifies the ITU H2.48 protocol media gateway control service type that is used when the DS0 is configured for null signaling.

6.7.5.3 Viewing or Modifying VIF Configuration

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, expand the VXSM card until you see the DS1 path you want to view VIFs under. Double-click the DS1 path. The DS1 Path tab appears.

Step 3 Choose **DSX0 Voice Parameters** or **Extended DSX0 Voice Parameters** from the **Category** drop-down arrow.

Step 4 Click on a VIF, then click **Details**.

Step 5 View or modify the fields.

Note Table 6-39 describes the fields in the VXSM DS1 Path, DSX0 Voice Parameters category; Table 6-40 describes the fields in the VXSM DS1 Path, Extended DSX0 Voice Parameters category.

Step 6 (Optional) Click **Apply** to save any changes.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-39 Field Descriptions for the VXSM DS1 Path, DSX0 Voice Parameters Category

Field Name	Description
DSX0 Grp Index	Index that uniquely identifies a DS0 group in a T1/E1.
Noise Reg Enable	Indicates whether or not the background noise should be played to fill silence gaps if VAD is activated.
Non Linear Proc Enable	Indicates whether or not nonlinear processing is enabled for this interface.
Music On Hold Threshold	Music on hold threshold for this interface.
In Gain	Amount of gain inserted at the receiver side of the interface.
Tx Attenuation	Amount of attenuation inserted at the transmit side of the interface.
Echo Cancel Enable	Specifies whether or not echo cancellation is enabled for the interface.
Echo Cancel Coverage	Echo canceller coverage for the interface.
Initial Digit Time Out	Initial digit timeout that indicates the amount of time the managed system waits for an initial input digit from the caller.
Inter Digit Time Out	Inter-digit timeout that indicates the amount of time the managed system waits for a subsequent input digit from the caller.

Table 6-40 Field Descriptions for the VXSM DS1 Path, Extended DSX0 Voice Parameters Category

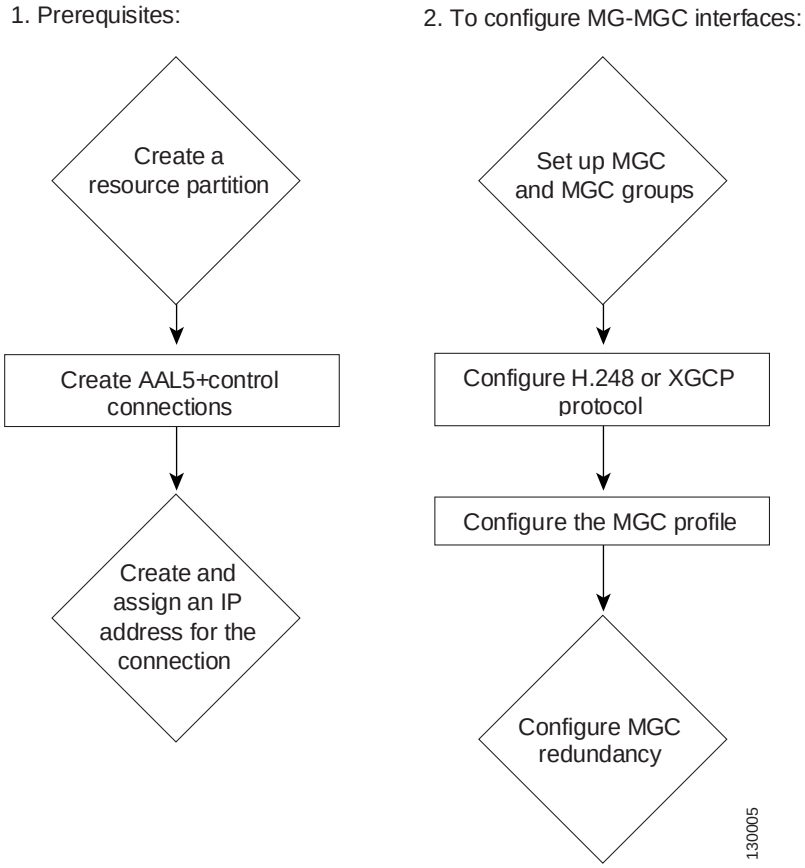
Field Name	Description
DSX0 Grp Index	Index that uniquely identifies a DS0 group in a T1/E1.
LIF Number	Logical InterFace number associated with this voice interface.
Call Control Profile	Index of call control profile used by this DS0 group.
VAD Enable	Indicates whether or not Voice Activity Detection is enabled for the compression DSPs of this interface.
CoT 1	First frequency tone to be sent between the terminating and originating gateways in the continuity test.
CoT 2	Second frequency tone to be sent between the terminating and originating gateways in the continuity test.
Repetition	Used to repeatedly apply the writable objects of ccasIfExtVoiceCfgTable specified in the same SNMP PDU starting from the row specified by the index of the instance for the number of rows specified in this object.
VAD Timer	Hangover time for VAD.
ICS Enable	Specifies whether or not the Idle Channel Suppression is enabled for an AAL2 connection.
ICS Integration Timer	Specifies a timeout value for the ICS integration timer.
Tone Plan	Specifies which tone plan the DS0 group is using for playing the tones.
Gateway Link ID	Specifies the H.248 media gateway link that this DS0 group belongs to. This object is applicable only if the value of Service Type is h248.
H.248 Pkg IDs	H.248 packages supported in this DS0 group.
Event Mapping Index	Specifies the actions of the voice band data signal events handling in this DS0 group.

6.7.6 Configuring MG-MGC Interfaces

VXSM cards support both the ITU H.248 and the XGCP protocols. Depending upon which protocol you are using, the procedure to configure the MG-MGC interface differs.

For each protocol type, the procedure consists of two phases. The first phase configures MGC and MGC Groups. The second phase configures the protocol and protocol profile details that are used for the VXSM and the MGC to communicate.

Figure 6-35 Process for Configuring MG-MGC Interfaces



Before you can configure MG-MGC interfaces, be sure you have completed the following steps:

Step 1 Add a resource partition to the node—See 6.7.1 Creating a Resource Partition for VXSM, page 6-63.

Step 2 Add an AAL5+control VXSM connection—See Chapter 7, "Provisioning Connections."

Step 3 Create and assign an IP address for the connection—See 6.7.3 Creating and Assigning an IP Address for the Connection, page 6-66.

To configure the interface between the Media Gateway (MG) and the Media Gateway Controller (MGC) for either protocol, complete the following steps:

Step 1 Setup MGC and MGC groups—See 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79.

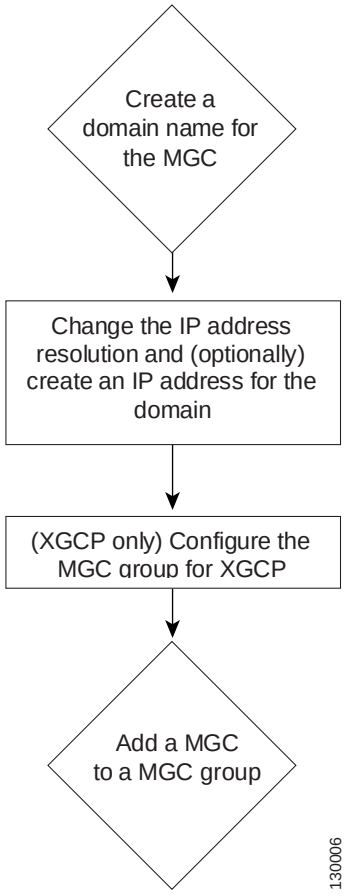
Step 2 Configure H.248 or XGCP protocol— See 6.7.6.2 Configuring H.248 Protocol and Profiles, page 6-87 or 6.7.6.3 Configuring XGCP Protocol, page 6-96.

Step 3 Configure the MGC profile—See 6.7.6.2 Configuring H.248 Protocol and Profiles, page 6-87 or 6.7.6.4 Configuring MGC XGCP Profiles, page 6-98.

Step 4 (Optional) Configure MGC redundancy—See 6.7.6.5 Configuring MGC Redundancy, page 6-101.

6.7.6.1 Setting Up MGCs and MGC Groups

Figure 6-36 Process for Setting Up MGCs and MGC Groups



Step 1 Create an MGC by assigning it a domain name, and specify how the domain name is to be resolved:

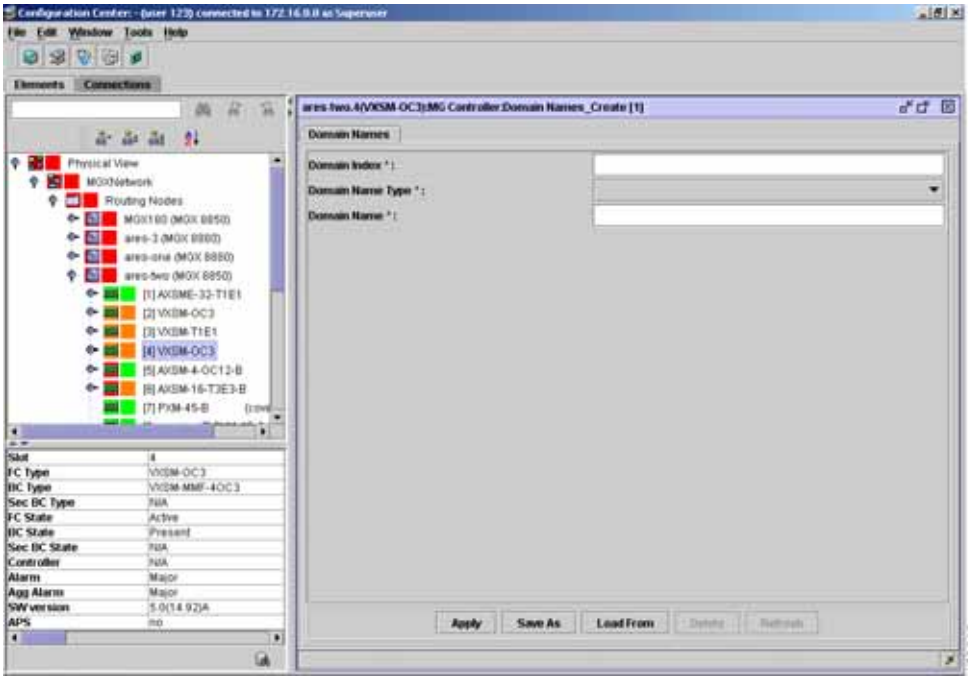
a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, double-click the VXSM card.

c. Click on the **MG Controller** tab. The Domain Names category appears by default.

d. Click **Create**. The Create MGC Domain Names window appears.

Figure 6-37 Configuration Center—VXSM Create MGC Domain Names Window



e. Configure the fields.

Note Table 6-41 describes fields in the VXSM Create MGC Domain Name window.

f. Click **Apply** to create the domain name.

Step 2 Change the IP address resolution and (optionally) create an IP address for the domain:

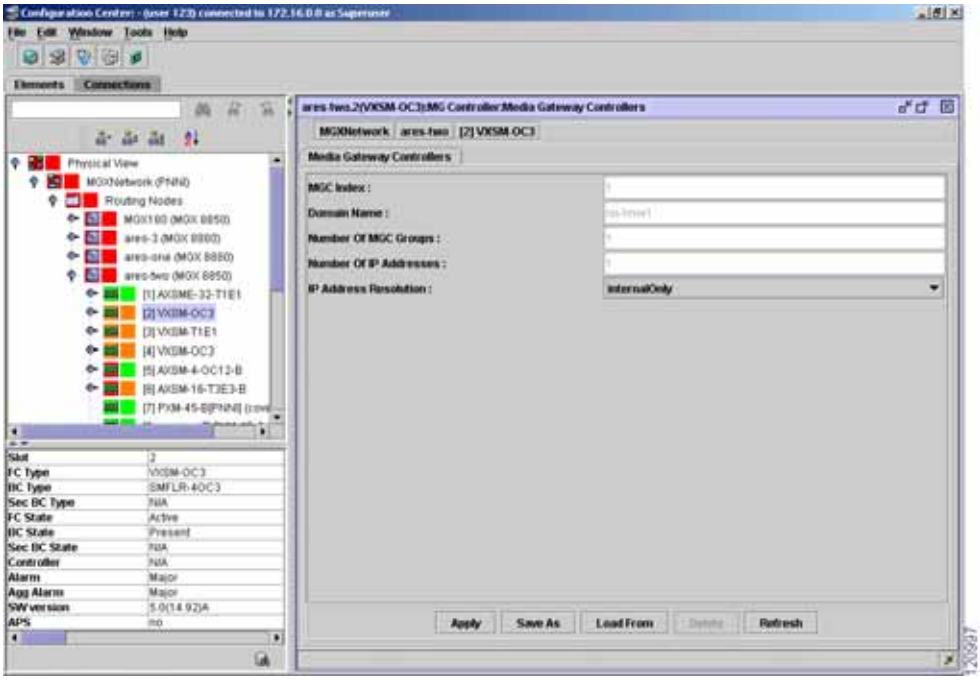
a. Under the **Elements** tab, within the node, double-click the VXSM card.

b. Click on the **MG Controller** tab.

c. From the **Category** drop-down arrow, choose the **Media Gateway Controllers** option.

d. Click on a MGC entry, then click **Details**. The Media Gateway Controllers tab appears.

Figure 6-38 Configuration Center—VXSM Media Gateway Controllers Tab



e. Configure the **IP Address Resolution** field.

Note Table 6-42 describes fields in the VXSM Media Gateway Controllers tab.

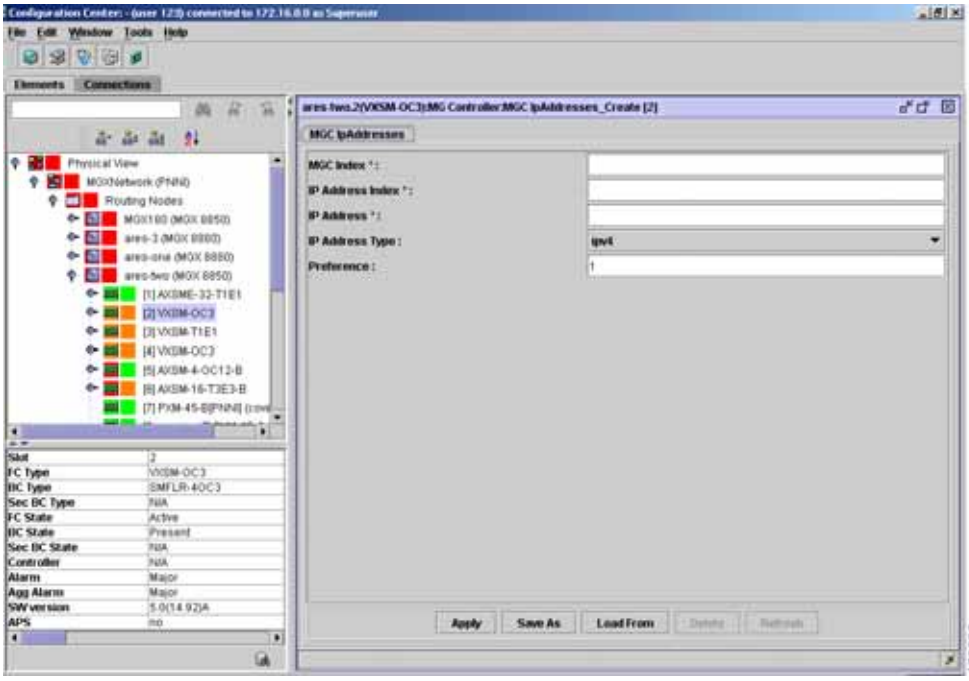
f. Click **Apply** to configure the IP address resolution.

g. If you selected internalOnly, proceed to step h to create an IP address for the domain. If you selected externalOnly, skip the rest of these steps and proceed to step 3.

h. Within the **MG Controller** tab, from the **Category** drop-down arrow, choose the **MGC IP Addresses** option.

i. Click **Create**. The Create MGC IP Addresses window appears.

Figure 6-39 Configuration Center—VXSM Create MGC IP Addresses Window



j. Configure the fields.

Note Table 6-43 describes fields in the VXSM Create MGC IP Addresses window.

k. Click **Apply** to create the MGC IP address.

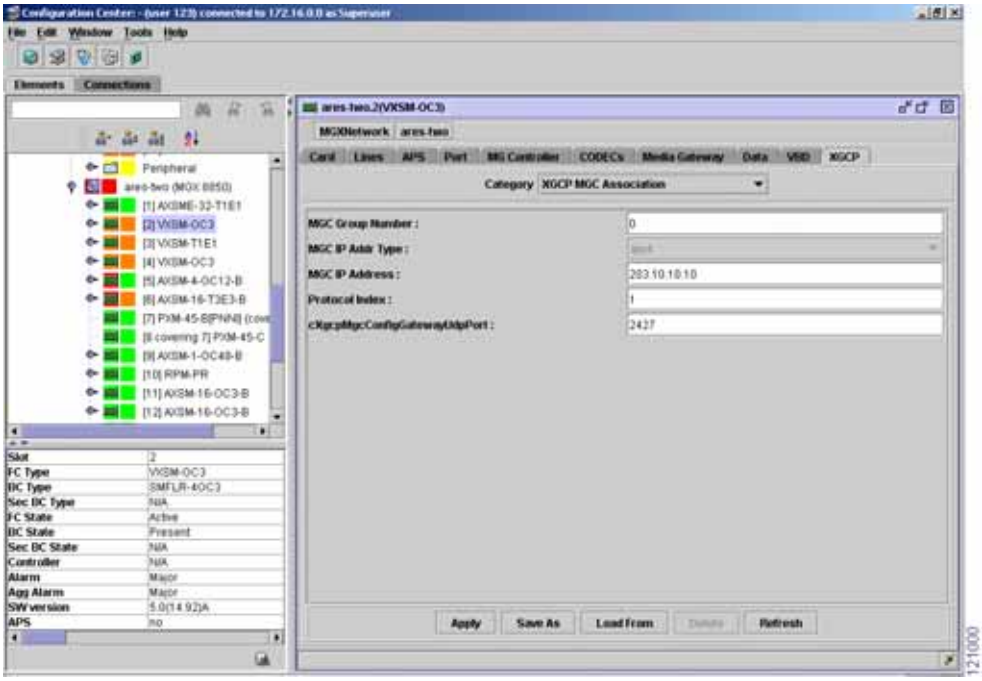
Step 3 (XGCP only, skip to step 4 if you are using H.248) Configure the MGC group for XGCP:

a. Under the **Elements** tab, within the node, double-click the VXSM card.

b. Click on the **XGCP** tab.

c. From the **Category** drop-down arrow, choose the **XGCP MGC Association** option.

Figure 6-40 Configuration Center—XGCP Tab, XGCP MGC Association Category



d. Configure the fields.

Note Table 6-44 describes fields in the VXSM XGCP tab, XGCP MGC Association category.

e. Click **Apply** to configure the MGC group for XGCP.

Step 4 Add a MGC to a MGC group:

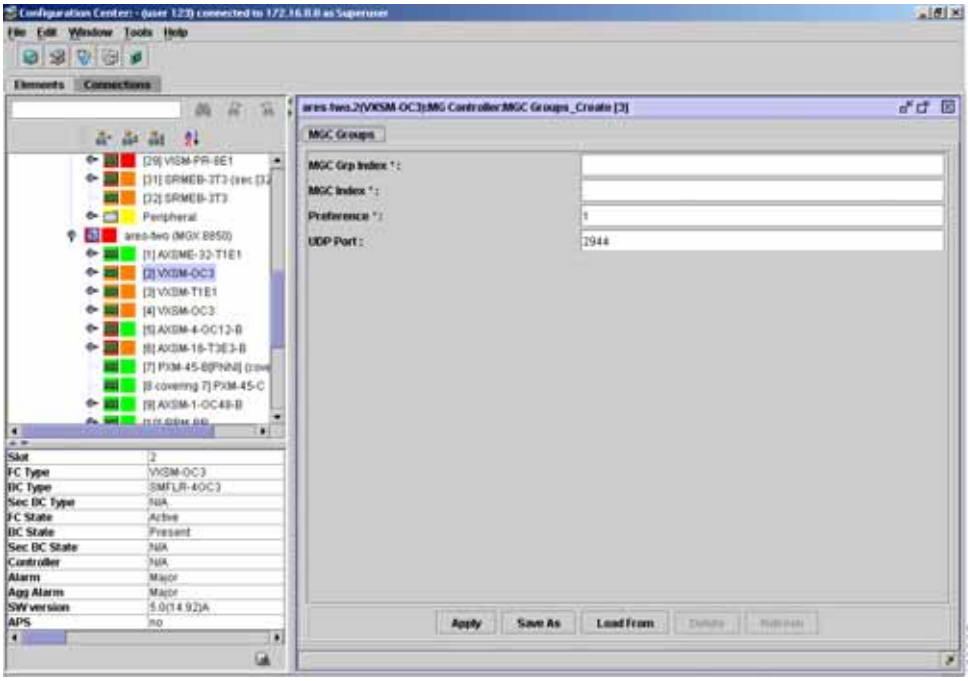
a. Under the **Elements** tab, within the node, double-click the VXSM card.

b. Click on the **MG Controller** tab.

c. From the **Category** drop-down arrow, choose the **MGC Groups** option.

d. Click **Create**. The Create MGC Groups window appears.

Figure 6-41 Configuration Center—VXSM Create MGC Groups Window



e. Complete the fields.

Note Table 6-45 describes fields in the VXSM Create MGC Groups window.

f. Click **Apply** to add a specific MGC to a particular MGC group.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-41 Field Descriptions for the VXSM Create MGC Domain Name Window

Field Name	Description
Domain Index	Enter an integer to identify a MGC domain name. The following values are valid: • For MGC, The range is from 1-4. • For a gateway, the value is 13. • For dnsServer, the value is 14.
Domain Name Type	Choose from the following types to indicate the entity for the domain name: • gateway • dnsServer • mgc
Domain Name	Enter the domain name. The maximum amount of characters is 64.

Table 6-42 Field Descriptions for the VXSM Media Gateway Controllers Tab

Field Name	Description
MGC Index	Unique index to identify each MGC which will communicate with this MG.
Domain Name	Contains the same name as the one in the cMgcDomainName object of the associated entry in cMediaGwDomainNameConfigTable.
Number of MGC Groups	Number of MGC group with which this MGC is associated. A zero value means this MGC is not associated with any MGC group.
Number of IP Addresses	Indicates the number of IP addresses associated with this MGC. A zero value means there is no IP address associated with this MGC. The MGC cannot be deleted if the value of this object is non-zero and if the IP Address Resolution field is set to internalOnly.
IP Address Resolution	Determines the type of resolution applied to this MGC. Values are: • internalOnly (default)—Specifies the internal resolution. If the **internalOnly** option is chosen, the IP address associated with the file server is determined according to the IP address of the server. • externalOnly—Specifies the external resolution.

Table 6-43 Field Descriptions for the VXSM Create MGC IP Address Window

Field Name	Description
MGC Index	Unique index value to identify each MGC that will communicate with this media gateway. The range is 1-4.
IP Address Index	Unique index value to identify the address of a specific MGC. The MGC is represented by cMgcIndex. The range is 1-4.
IP Address	Configured IP address.

Table 6-43 Field Descriptions for the VXSM Create MGC IP Address Window (continued)

Field Name	Description
IP Address Type	IP address type for the MGC (call agent): unknown ipv4 ipv6 ipv4z ipv6z dns
Preference	Preference value of the IP address for the specific MGC (call agent). If the value is lower, the preference of the IP address is higher. For example, the value 1 has a higher preference than the value 2. If several IP addresses have the same preference value, the media gateway selects them one at a time. The range is from 1-4. The default value is 1.

Table 6-44 Field Descriptions for the VXSM XGCP Tab, XGCP MGC Association Category

Field Name	Description
MGC Group Number	Specifies which MGC redundant group will be used in XGCP. The value of this object refers to the object cMgcGrpIndex from MGC Redundant Group Table, cMgcGrpParamTable.
MGC IP Addr Type	Specifies the address type of MGC (object cXgcpMgcConfigAddress) either ipv4 or ipv6.
MGC IP Address	Specifies the address of MGC (call agent) the gateway used to communicate within call setup.
Protocol Index	Specifies which protocol the MG should use to communicate with MGC when it attempts to set up the call.
cXgcpMgcConfigGatewayUdpPort	The UDP port of the MG which is used to communicate with the call agent in MGCP.

Table 6-45 Field Descriptions for the VXSM Create MGC Groups Window

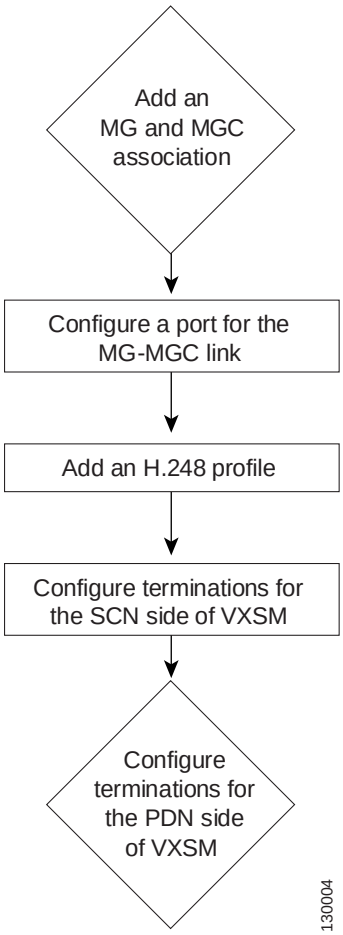
Field Name	Description
MGC Grp Index	Unique index value to identify the particular MGC group. The range is 1-12.
MGC Index	Unique index value to identify each MGC (call agent) that communicates with the media gateway. The range is 1-4.
Preference	Preference value of the IP address for the specific MGC (call agent). If the value is lower, the preference of the IP address is higher. For example, the value 1 has a higher preference than the value 2. If several IP addresses have the same preference value, the media gateway selects them one at a time. The range is from 1-12. The default value is 1.
UDP Port	Value to represent the UDP port of the MGC in the MGC group. A value of 0 means that no UDP port is specified. Therefore, the UDP port that is already in the protocol table is used. The range is 1024-65535.

6.7.6.2 Configuring H.248 Protocol and Profiles

A Media Gateway (MG) communicates with a group of MGCs through a MG link. Both the MG and MGC group form an H.248 association.

Once you have completed the steps in 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79, perform the following steps to configure H.248 protocol and profiles:

Figure 6-42 Process for Configuring H.248 Protocol and Profiles



Step 1 Add an MG and MGC Association:

a. From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

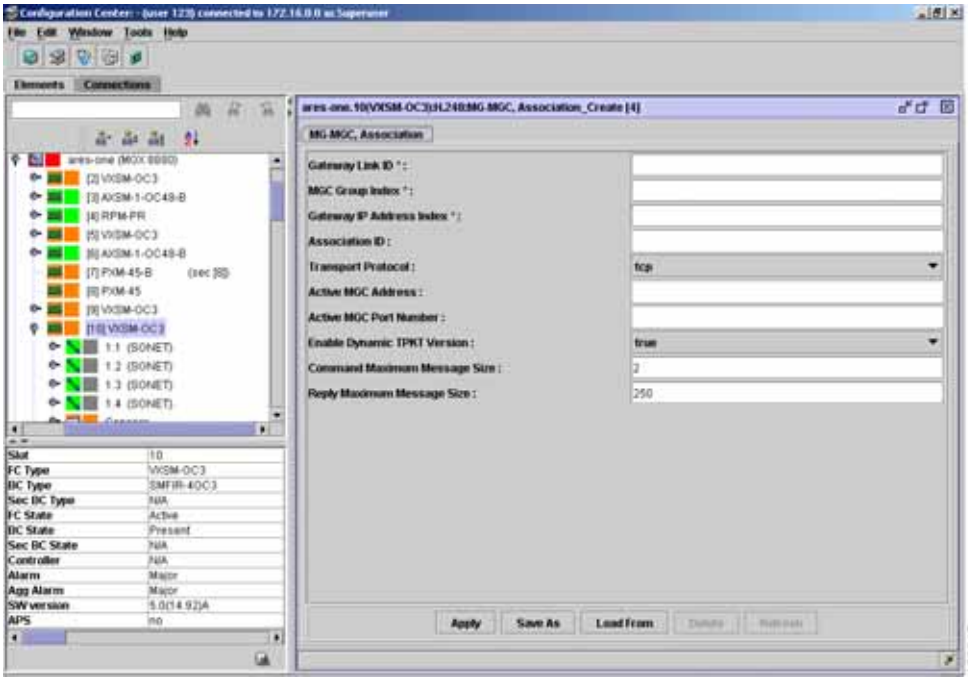
b. Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

c. Click the **H.248** tab.

d. Choose the **MG-MGC Association** option from the **Category** drop-down arrow.

e. Click **Create** to display the Create MG-MGC Association window.

Figure 6-43 Configuration Center—VXSM Create MG-MGC Association Window



f. Complete the fields.

Note Table 6-46 describes fields in the VXSM Create MG-MGC Association window.

g. Click **Apply** to add an H.248 association between the MG and MGC. Once you have created an MG-MGC association, an entry will appear in the H.248 tab, Extended Association category.

Step 2 Configure a port for the MG-MGC link:

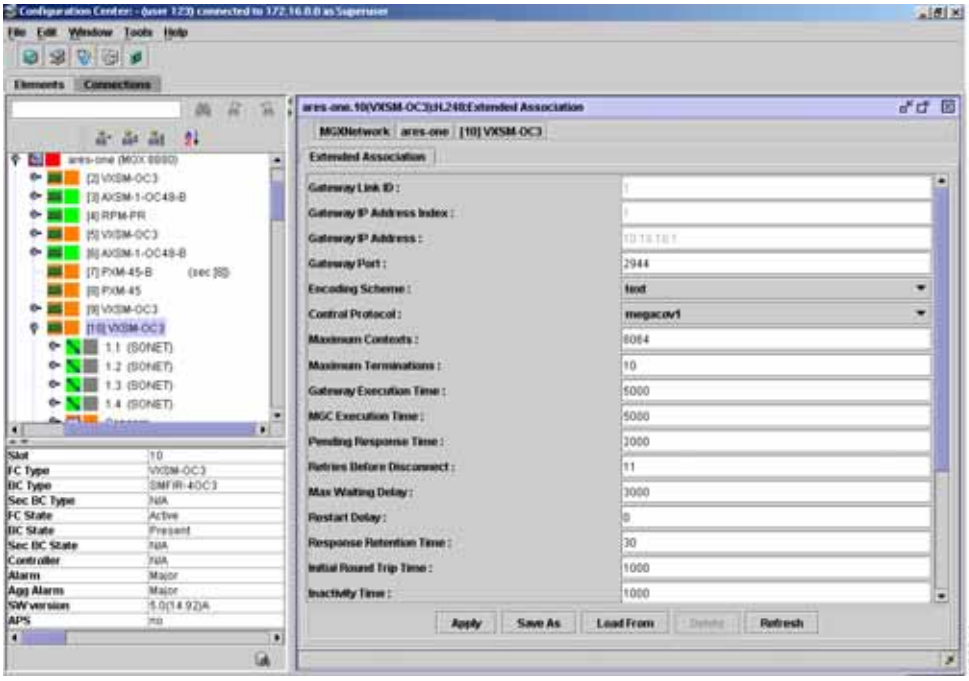
a. Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

b. Click the **H.248** tab.

c. Choose the **Extended Association** option from the **Category** drop-down arrow.

d. Click on a link entry, then click **Details**. The Extended Association tab appears.

Figure 6-44 Configuration Center—VXSM Extended Association Tab



e. Configure the **Gateway Port**, and other fields as desired.

Note Table 6-47 describes fields in the VXSM Extended Association tab.

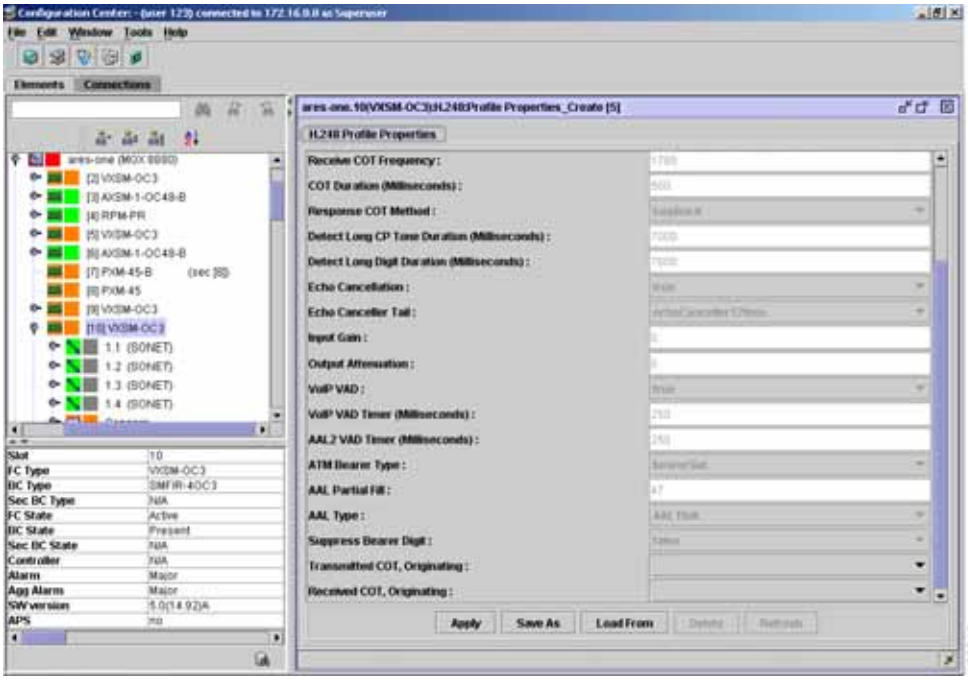
f. Click **Apply** to configure the port for the MG-MGC link.

Step 3 Add an H.248 profile:

a. Within the **H.248** tab, choose the **Profile Properties** option from the **Category** drop-down arrow.

b. Click **Create**. The Create H.248 Profile Properties window appears.

Figure 6-45 Configuration Center—VXSM Create H.248 Profile Properties Window



c. Configure the fields.

Note Table 6-48 describes fields in the VXSM Create H.248 Profile Properties window.

d. Click **Apply** to create the H.248 profile.

Step 4 Configure terminations for the switch circuit network (SCN) side of VXSM:

a. Add a voice interface (VIF)—See 6.7.5 Configuring Voice Interfaces, page 6-74.

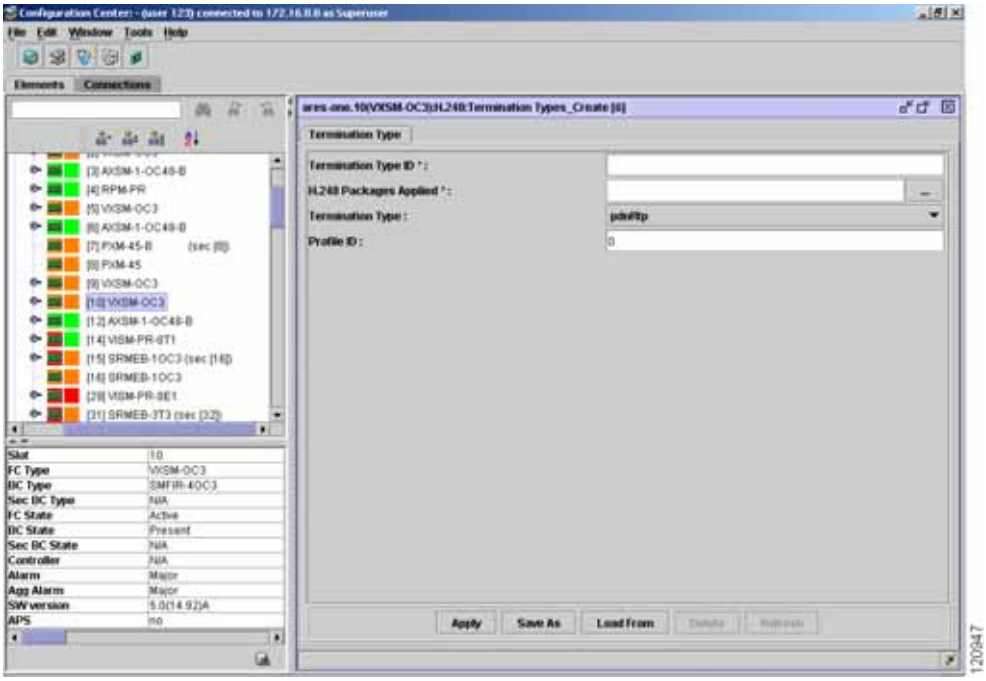
b. Associate the Gateway Link ID and H.248 Pkg ID by completing the Gateway Link ID and H.248 Pkg IDs fields—See 6.7.5.3 Viewing or Modifying VIF Configuration, page 6-76).

Step 5 Configure terminations for the packet data network (PDN) side of VXSM:

a. Within the **H.248** tab, choose the **Termination Types** option from the **Category** drop-down arrow.

b. Click **Create**. The Create H.248 Termination Types window appears.

Figure 6-46 Configuration Center—VXSM Create H.248 Termination Types Window



c. Configure the fields.

Note Table 6-49 describes fields in the VXSM Create H.248 Termination Types window.

d. Click **Apply** to create the H.248 termination type.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-46 Field Descriptions for the VXSM Create MG-MGC Association Window

Field Name	Description
Gateway Link ID	Unique link ID that identifies the signalling link this gateway uses to communicate with the Gateway Controllers to form an H.248 association. Enter the value of **1** to identify the MG to MGC link in the **Gateway Link ID** field. Only one link is supported.
MGC Group Index	Unique index value to identify the particular MGC group. The range is 1-12.
Gateway IP Address Index	Index value for the IP address of the media gateway. The range is 1-16.
Association ID	Unique identification of the H.248 association assigned by the H.248 stack.

Table 6-46 Field Descriptions for the VXSM Create MG-MGC Association Window (continued)

Field Name	Description
Transport Protocol	Choose one of the following options that is used for the signaling traffic associated with the H.248 protocol from the **Transport Protocol** drop-down arrow: • **tcp** (default)—Transport Control Protocol (TCP) • **udp**—User Datagram Protocol (UDP)
Active MGC Address	Address of the currently active MGC in this media gateway link.
Active MGC Port Number	Transport layer port number of the currently active MGC in this media gateway link.
Gateway Link Admin State	Desired state of the gateway.
Gateway Link Operational State	Current operational state of the gateway.

Table 6-47 Field Descriptions for the VXSM Extended Association Tab

Field Name	Description
Gateway Link ID	Unique link ID which identifies the signaling link this gateway is uses to communicate with the gateway controllers to form an H.248 association.
Gateway IP Address Index	MG IP address index.
Gateway IP Address	IP address that the MGC uses to communicate with the MG.
Gateway Port	TCP/UDP port number that the MGC uses to communicate with the MG.
Encoding Scheme	Used to encode the H.248 messages that are sent/received to/from the gateway controller.
Control Protocol	Control protocol type in use.
Maximum Contexts	Maximum number of contexts allowed in this media gateway link.
Maximum Terminations	Maximum number of terminations per context in this media gateway link.
Gateway Execution Time	Interval within which the MGC expects a response to any transaction from the MG (exclusive of network delay specified by the object cmedxGatewayInitialRtt).
MGC Execution Time	Interval within which the MG expects a response to any transaction from the MGC (exclusive of network delay specified by the object cmedxGatewayInitialRtt).
Pending Response Time	Time within which to expect a pending response if a transaction cannot be completed in the MG and in the MGCs of the media gateway link.
Retries Before Disconnect	Number of times the MG retries to connect to the MGC before it sends out a disconnect command
Max Waiting Delay	When a MG is powered on, it should initiate a restart timer to a random value, uniformly distributed between zero and the value specified in this object.

Table 6-47 Field Descriptions for the VXSM Extended Association Tab (continued)

Field Name	Description
Restart Delay	Time delay before the MG accepts any call from MGC after it sends the command “service change” with a “restart.”
Response Retention Time	Time till the responses should be retained before they are sent if they receive a repetition of a transaction that is still being executed.
Initial Round Trip Time	Initial round-trip time for the H.248 transaction to be responded. Reflects the network delay time.
Inactivity Time	Period of silence between messages from the MGC.
H.248 Header IP Address Type	Address type in the H.248 message header.
Grace Period for Service Down	Grace period before the media gateway link is taken out of service.
Active MGC Domain Name	Domain name of the currently active MGC in this media gateway link.
Operational State Change Reason	Reason for the operational state change (cmedGatewayOperStatus) in the media gateway link.
Operational State Change Method	Method for the operational state change (cmedGatewayOperStatus) in the media gateway link.
Gateway Link Service State	Actions to modify media gateway link service state.
Gateway Link Operational State	Operational status of media gateway link.

Table 6-48 Field Descriptions for the VXSM Create H.248 Profile Properties Window

Field Name	Description
H.248 Profile Index	Unique identifier for the H.248 profile.
Inter CP Tone Duration (milliseconds)	Duration for playing a list of call progressing tones between two call progressing signals.
Digit On Duration (milliseconds)	Duration of the active DTMF digit during DTMF playout from the gateway.
Digit Pause Duration (milliseconds)	Duration of the pause after an active DTMF digit during DTMF playout from the gateway.
Transmit COT Frequency	Tone frequency to be transmitted between gateways in the continuity test.
Receive COT Frequency	Tone frequency to be received between gateways in the continuity test.
COT Duration (milliseconds)	Duration for the continuity test tone to be played when the gateway initiates a COT (continuity test tone).
Response COT Method	Method for responding to COT (continuity test tone) when the gateway detects the continuity test signal.

Table 6-48 Field Descriptions for the VXSM Create H.248 Profile Properties Window (continued)

Field Name	Description
Detect Long CP Tone Duration (milliseconds)	Duration for detecting a long call progressing tone.
Detect Long Digit Duration (milliseconds)	Duration for detecting a long digit tone signal.
Echo Cancellation	Specifies whether or not the echo cancellation is enabled.
Echo Canceller Tail	Echo canceller coverage.
Input Gain	Amount of gain inserted at the receiver side of the interface.
Output Attenuation	Amount of attenuation inserted at the transmit side of the interface.
VoIP VAD	VAD (Voice Activity Detection) is enabled for the compression DSPs of this interface when the application is VoIP.
VoIP VAD Timer (milliseconds)	Hangover time for VAD in the VoIP application.
AAL2 VAD Timer (milliseconds)	Hangover time for VAD in the VoATM over AAL2 application.
ATM Bearer Type	ATM bearer type.
AAL Partial Fill	Fill level of cells in case of AAL adaptation.
AAL Type	Adaption layer of ATM.
Suppress Bearer Digit	Controls if the digits should be suppressed from the voice media stream.
Transmitted COT, Originating	Specifies the COT tone to be transmitted from the originating gateway in the continuity test.
Received COT, Originating	Specifies the COT tone to be received from the originating gateway in the continuity test.

Table 6-49 Field Descriptions for the VXSM Create H.248 Termination Types Window

Field Name	Description
Termination Type ID	Unique identification number that is assigned to the termination type by the manager.
H.248 Packages Applied	H.248 packages applied to this termination type.
Termination Type	Type of a group of ephemeral terminations.
Profile ID	Property profile identifier with which the terminations within this termination type will be associated.

6.7.6.3 Configuring XGCP Protocol

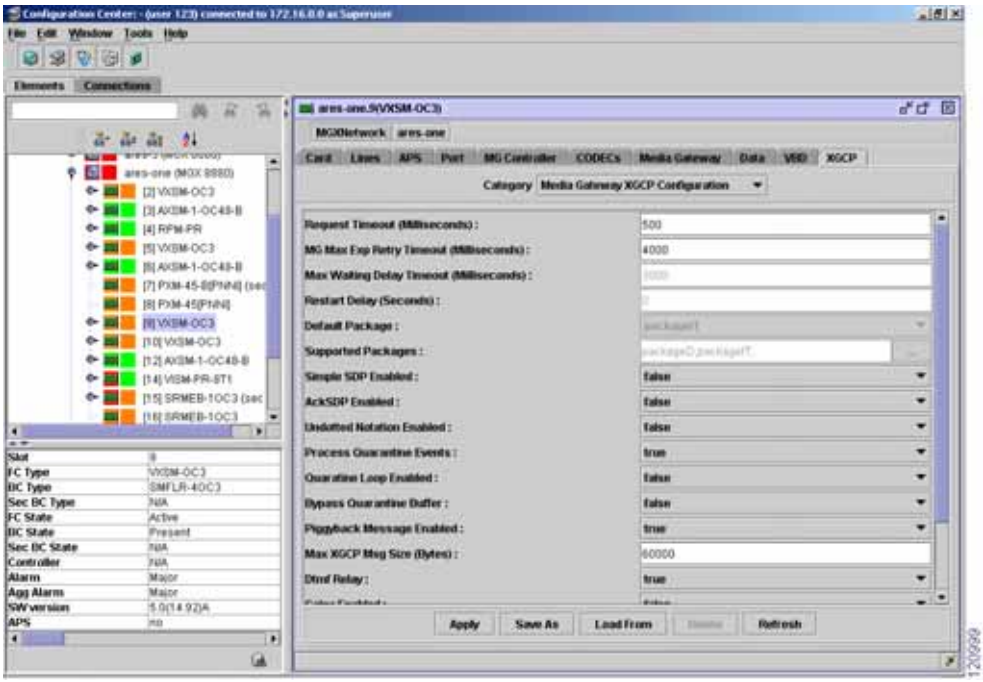
Once you have completed the steps in 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79, perform the following steps to configure XGCP (TGCP) protocol:

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Under the **Elements** tab, within the node, double-click the VXSM card.

Step 3 Click on the **XGCP** tab. The **Media Gateway XGCP Configuration** option appears by default in the **Category** drop-down arrow.

Figure 6-47 Configuration Center—VXSM XGCP Tab, Media Gateway XGCP Configuration Category



Step 4 Configure the fields.

Note Table 6-50 describes fields in the VXSM XGCP tab, Media Gateway XGCP Configuration category.

Step 5 Click **Apply** to configure XGCP (TGCP) protocol.

Table 6-50 Field Descriptions for the VXSM XGCP Tab, Media Gateway XGCP Configuration Category

Field Name	Description
Request Timeout (milliseconds)	Period that the XGCP (TGCP) protocol waits before re-transmitting an unacknowledged message. It is the responsibility of the requesting entity to provide suitable timeouts for all outstanding commands, and to retry commands when timeouts exceeded.
MG Max Exp Retry Timeout (milliseconds)	Specifies the maximum timeout for exponential command retry by the media gateway.
Max Waiting Delay Timeout (milliseconds)	Value used for the media gateway to send the first restart in progress to the MGC in an implementation-dependent manner by the MGCP functionality based on the call volume of the system.
Restart Delay (seconds)	Specifies the restart delay timeout for the restart process for a gateway to send out RestartInProgress when it is powered on or has been reset.
Default Package	Represents the default capability package supported in the gateway.
Supported Packages	Represents the bit map of MGCP supported packages.
Simple SDP Enabled	Used to enable or disable building of s, t, and o lines in the Sessions Description Protocol (SDP) message. The o field indicates the owner/creator and session identifier. The s field indicates the session name field. The t field indicates the duration while a session is valid. A value of true (enabled) means that SDP will NOT include the fields s, t, and o. A value of false (disabled) means that the o, s, and t lines will be built before sending SDP.
AckSDP Enabled	Specifies if the ACK SDP is enabled or disabled. If the value is true (enabled) it sends ADP with ACK when CODEC or reportable NTE delta changed, or an attempt is made to change CODEC, VAD, packet-period, echo cancellation during FAX/modem mode.
Undotted Notation Enabled	Enables or disables the undotted notation for CODEC. This object is used to set CODEC notation to dotted or undotted in SDP between the gateway and the call agent.
Process Quarantine Events	Determines how to handle persistent events. If the value is true, the quarantined events should be processed, otherwise the quarantined events are discarded.
Quarantine Loop Enabled	Controls the default quarantine mode. If the value is true, the default quarantine mode is loop and not step. The gateway is expected to generate multiple notifications (loop) not at most one notification
Bypass Quarantine Buffer	Specifies how the persistent events will be handled in quarantine processing. If the value is true, the persistent events bypass quarantine buffer. If the value is set to false, this object will be ignored.
Piggyback Message Enabled	Enables or disables the piggyback message generation. If the value is true, a call agent can send several MGCP messages in the same UDP packets to the gateway.
Max XGCP Msg Size (bytes)	Specifies the maximum allowed XGCP (TGCP) message size which is used for checking if the size will be supported by the call agent via (AuditEndPoint) response. A value of zero means there is no limit to the size of the XGCP message.

Table 6-50 Field Descriptions for the VXSM XGCP Tab, Media Gateway XGCP Configuration Category (continued)

Field Name	Description
Dtmf Relay	When the value is true, the digits will be sent as peer-to-peer packet in the bearer. When the value is false, the digits will be sent as regular voice packets in the bearer.
Calea Enabled	CALEA, or Communication Assistance for Law Enforcement Act, is a feature that allows for a lawful intercept of a call's details and call contents originating or terminating on specific terminals. A value of true indicates that CALEA is enabled; a value of false indicates that CALEA is disabled.
Gateway Service State	Defines the service state of the media gateway.
Gateway Admin State	Defines the administrative state of the media gateway.
Grace Time (seconds)	Represents the grace period (restart delay in RSIP message) which is expressed in a number of seconds. It indicates how soon the gateway will be taken out of service. The value -1 indicates that the grace period time is disabled.

6.7.6.4 Configuring MGC XGCP Profiles

To configure MGC XGCP profiles, you must create a call control profile.

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

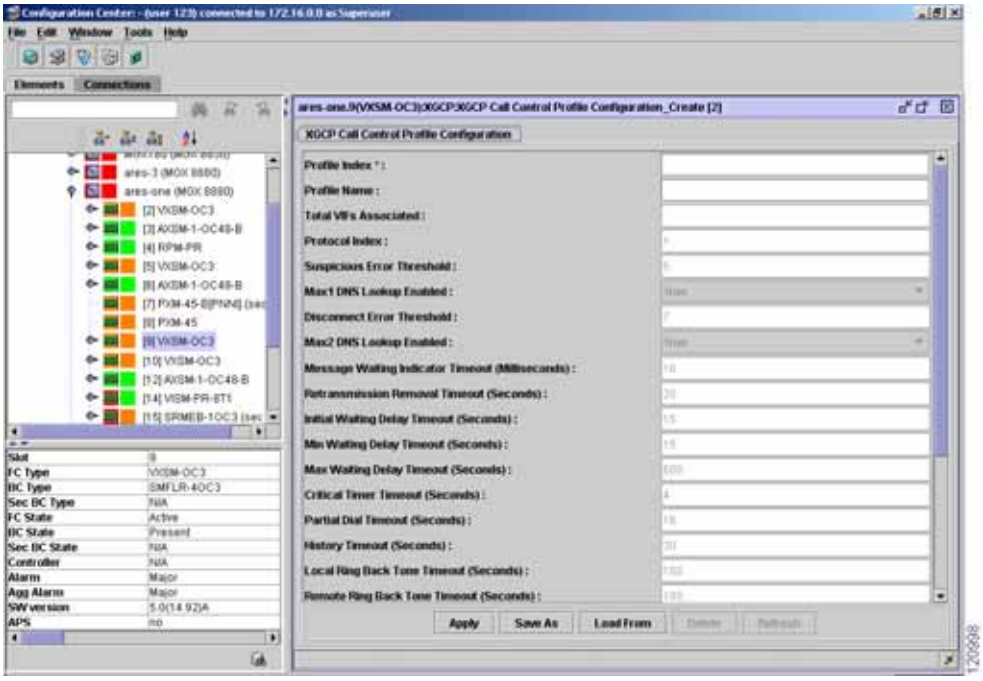
Step 2 Under the **Elements** tab, within the node, double-click the VXSM card.

Step 3 Click on the **XGCP** tab.

Step 4 Choose the **XGCP Call Control Profile Configuration** option from the **Category** drop-down arrow.

Step 5 Click **Create**. The Create XGCP Call Control Profile window appears.

Figure 6-48 Configuration Center—VXSM Create XGCP Call Control Profile Window



Step 6 Configure the fields.

Note Table 6-51 describes fields in the VXSM Create XGCP Call Control Profile window.

Step 7 Click **Apply** to create the XGCP (TGCP) call control profile.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-51 Field Descriptions for the VXSM Create XGCP Call Control Profile Window

Field Name	Description
Profile Index	Uniquely identifies the call control profile.
Profile Name	Unique name for the profile. This cannot be modified once it is created.
Total VIFs Associated	Total number of voice interfaces (DS0 group) associated with this call control profile. A value of zero means there are no voice interfaces associated with the profile.
Protocol Index	Specifies the protocol that the MG should use to communicate with the MGC during call setup.
Suspicious Error Threshold	Contains the suspicious error threshold for signaling messages.

Table 6-51 Field Descriptions for the VXSM Create XGCP Call Control Profile Window (continued)

Field Name	Description
Max1 DNS Lookup Enabled	Enables or disables the Max1 domain name server (DNS) query operation when Max1 expires.
Disconnect Error Threshold	Contains the disconnect error threshold for signaling messages.
Max2 DNS Lookup Enabled	Enables or disables the Max2 domain name server (DNS) query operation when Max2 expires.
Message Waiting Indicator Timeout (milliseconds)	Timeout value for the message waiting indicator (MWI) tone. The MWI tone is used with message waiting services, and indicates that the MG is not ready to accept address information or other information from an access line.
Retransmission Removal Timeout (seconds)	Timeout value for re-transmission removal.
Initial Waiting Delay Timeout (seconds)	The voice interface (DS0 group) becomes disconnected when the MG tries to communicate with the call agent and the re-transmission procedure times out after re-trying.
Min Waiting Delay Timeout (seconds)	The DS0 group (voice interface) becomes disconnected when the MG tries to communicate with the call agent and the re-transmission procedure times out after re-trying
Max Waiting Delay Timeout (seconds)	Maximum waiting delay (Tdmax) timeout value used by the MG to send the restart in progress with the restart method as RM:disconected to the call agent when the voice interface associated ds0-group disconnection condition occurs.
Critical Timer Timeout (seconds)	Represents the timeout value for the critical timer.
Partial Dial Timeout (seconds	Represents the partial dial timeout and is used along with a digit map as the inter-digit timer.
History Timeout (seconds)	The MGCP protocol is organized as a set of transactions, each of which is composed of a command and a response. In the absence of a timely response, commands are repeated. The MG must keep in memory a list of the responses it sent to recent transactions, and a list of the transactions that are currently being executed. Recent is here defined by the value of cxeCcProfileThistTimeout that specifies the number of seconds that responses to old transactions must be kept for.
Local Ring Back Tone Timeout (seconds)	The time for which the local ring back tone (towards the TDM) will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
Remote Ring Back Tone Timeout (seconds)	Specifies the time for which the remote ring back tone (towards the packet network) will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
Congestion Tone Timeout (seconds)	Specifies the time for network congestion tone to be generated. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
Busy Tone Timeout (seconds)	Specifies the time for which the busy tone will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.

Table 6-51 Field Descriptions for the VXSM Create XGCP Call Control Profile Window (continued)

Field Name	Description
Dial Tone Timeout (seconds)	Specifies the time for which the dial tone will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
Confirmation Dial Tone Timeout (seconds)	Specifies the time for which the stutter or confirmation dial tone will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
Ringing Cadence Tone Timeout (seconds)	Specifies the time for which the ringing cadence will be generated towards the basic PBX unless interrupted. A value of zero indicates that the cadence will be generated indefinitely unless interrupted.
Reorder Tone Timeout (seconds)	Specifies the time for which the reorder tone or fast busy tone will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
COT1 Timeout (seconds)	Specifies time for which the continuity test tone 1 will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.
COT2 Timeout (seconds)	Specifies time for which the continuity test tone 1 will be generated unless interrupted. A value of zero indicates that the tone will be generated indefinitely unless interrupted.

6.7.6.5 Configuring MGC Redundancy

MGCs configured in an MGC group form a set of redundant MGCs, up to a maximum of 4. The order in which MGCs are added to the group is the order of preference for selecting the MGC to use. Besides having up to 4 MGCs in a group, each MGC can have up to 4 IP addresses.

To configure MGC redundancy:

Step 1 Create an MGC by assigning it a domain name, and specify how the domain name is to be resolved (see Step 1 in section 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79).

Step 2 Change the IP address resolution and (optionally) create an IP address for the domain (see Step 2 in section 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79).

Step 3 Add another MGC to a MGC group (see Step 4 in section 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79).

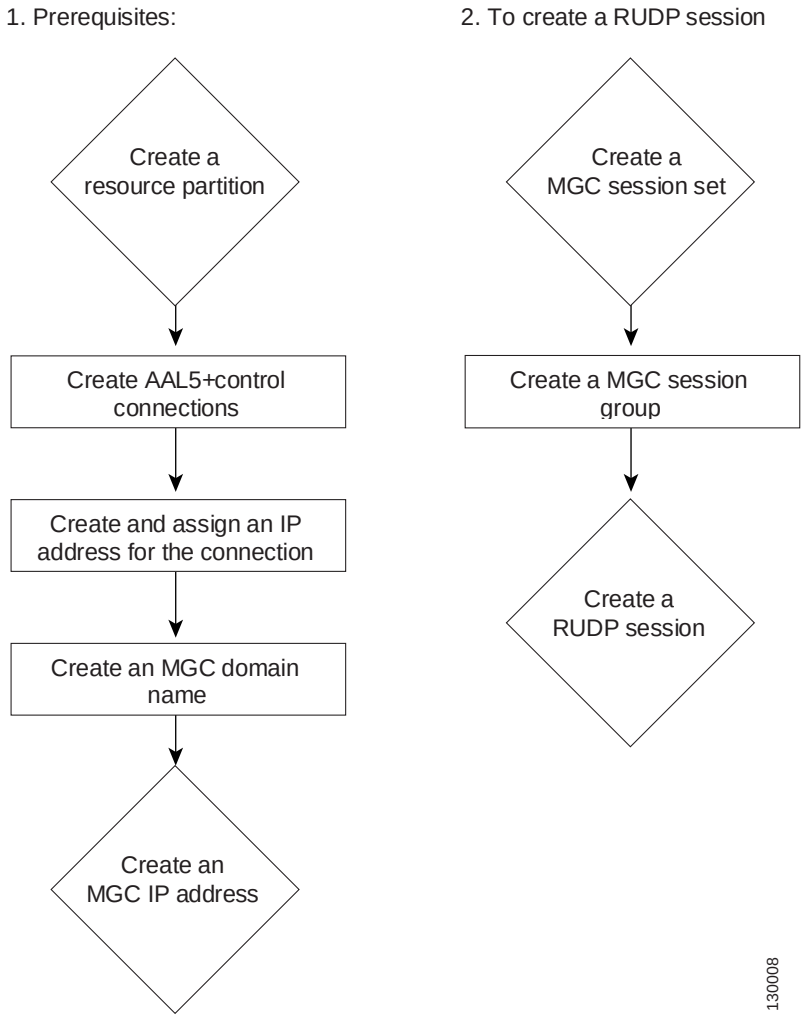
6.7.7 How Do I Configure VXSM Features?

This section contains the following information:

- 6.7.7.1 Creating a RUDP Session, page 6-102
- 6.7.7.2 Configuring Voiceband Data, page 6-108
- 6.7.7.3 Creating PRI-BH, page 6-111
- 6.7.7.4 Configuring Announcements, page 6-113

6.7.7.1 Creating a RUDP Session

Figure 6-49 Process for Creating a RUDP Session



Before you can create a RUDP session, be sure you have completed the following steps:

Step 1 Create a resource partition on the node—See 6.7.1 Creating a Resource Partition for VXSM, page 6-63.

Step 2 Create an AAL5+control VXSM connection—See Chapter 7, "Provisioning Connections."

Step 3 Create and assign an IP address for the connection—See 6.7.3 Creating and Assigning an IP Address for the Connection, page 6-66.

Step 4 Create an MGC domain name—See 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79.

Step 5 Create an MGC IP address—See 6.7.6.1 Setting Up MGCs and MGC Groups, page 6-79.

To proceed with the creation of a RUDP session, complete the following steps:

Step 1 Create a MGC session set—See 6.7.7.1.1 Creating a MGC Session Set, page 6-103.

Step 2 Create a MGC session group—See 6.7.7.1.2 Creating a MGC Session Group, page 6-104.

Step 3 Create a RUDP session—See 6.7.7.1.3 Creating a RUDP Session, page 6-106.

6.7.7.1.1 Creating a MGC Session Set

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

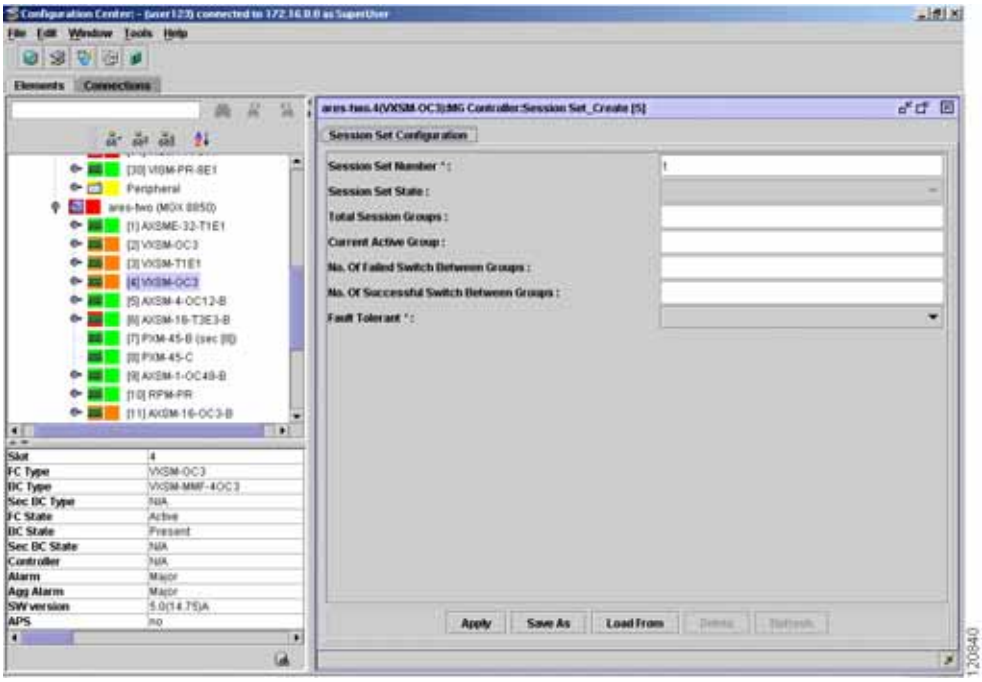
Step 2 Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

Step 3 Click the **MG Controller** tab.

Step 4 Choose the **Session Set** option from the **Category** drop-down arrow.

Step 5 Click **Create** to display the Create Session Set window.

Figure 6-50 Configuration Center—VXSM Create Session Set Window



Step 6 Complete the fields.

Note Table 6-52 describes fields in the VXSM Create Session Set window.

Step 7 Click **Apply** to add a MGC session set.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-52 Field Descriptions for the VXSM Create Session Set Window

Field Name	Description
Session Set Number	Logical index of this table. Currently only set 1 is used and all the signalling channels are implicitly mapped to set 1.
Session Set State	Denotes the state this set is in.
Total Session Groups	Keeps track of the number of session groups that has been added to a session set.
Current Active Group	Current active group number.
Number of Failed Switch Between Groups	Keeps track of failed attempts to switch between session groups in this set.
Number of Successful Switch Between Groups	Keeps track of successful attempts to switch between session groups in this set.
Fault Tolerant	Indicates whether the set configuration is fault tolerant or not.

6.7.7.1.2 Creating a MGC Session Group

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

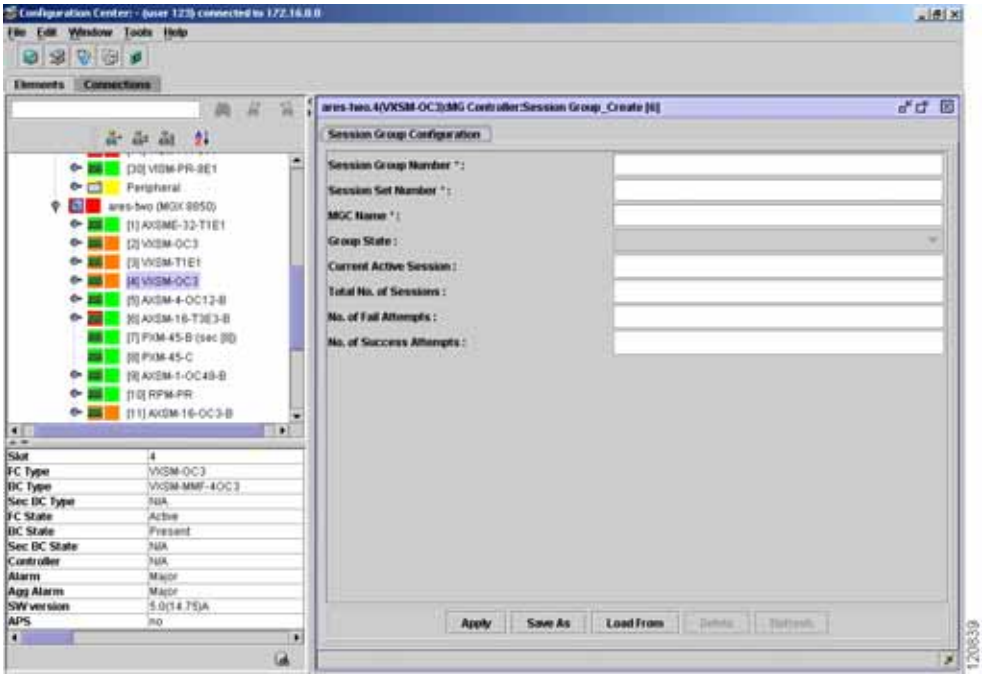
Step 2 Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

Step 3 Click the **MG Controller** tab.

Step 4 Choose the **Session Group** option from the **Category** drop-down arrow.

Step 5 Click **Create** to display the Create Session Group window.

Figure 6-51 Configuration Center—VXSM Create Session Group Window



Step 6 Complete the fields.

Note Table 6-53 describes fields in the VXSM Create Session Group window.

Step 7 Click **Apply** to add a MGC session group.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-53 Field Descriptions for the VXSM Create Session Group Window

Field Name	Description
Session Group Number	Index for this table. One set can have up to two groups.
Session Set Number	Session set number to which this session group belongs.
MGC Name	Denotes the name of the media gateway controller. This corresponds to a domain name under which the MGC could also be registered in a DNS.
Group State	State the session group is in.
Current Active Session	Indicates the current session that is open to communication with the MGC. There is only one action session per session group.
Total Number of Sessions	Keeps track of the total number of sessions that have been added to this group.

Table 6-53 Field Descriptions for the VXSM Create Session Group Window (continued)

Field Name	Description
Number of Fail Attempts	Keeps track of failed attempts to switch between sessions in this group.
Number of Success Attempts	Keeps track of successful attempts to switch between sessions in this group.

6.7.7.1.3 Creating a RUDP Session

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

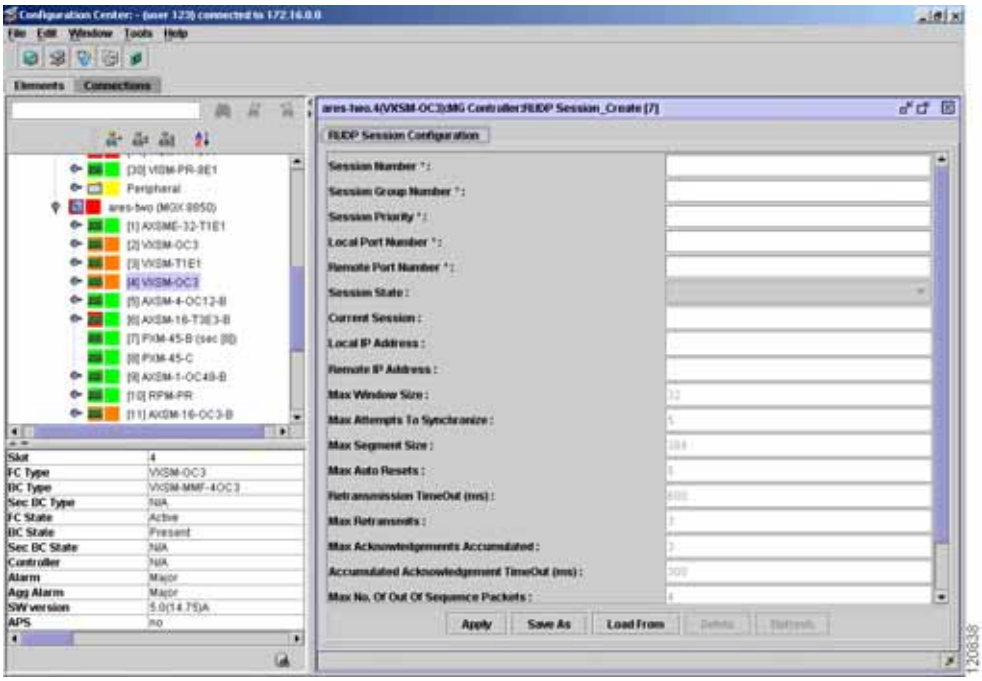
Step 2 Within the **Elements** tab, expand the node, then double-click the VXSM card that contains the connection you created.

Step 3 Click the **MG Controller** tab.

Step 4 Choose the **RUDP Session** option from the **Category** drop-down arrow.

Step 5 Click **Create** to display the Create RUDP Session window.

Figure 6-52 Configuration Center—VXSM Create RUDP Session Window



Step 6 Complete the fields.

Note Table 6-54 describes fields in the VXSM Create RUDP Session window.

Step 7 Click **Apply** to add a RUDP session.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-54 Field Descriptions for the VXSM Create RUDP Session Window

Field Name	Description
Session Number	Index for this table. One group can have a maximum of four sessions.
Session Group Number	A mandatory parameter if session type is backhaul, indicates the session group that this session belongs to.
Session Priority	When a session fails, it indicates which session the session manager should try to bring active. A lower number means higher priority.
Local Port Number	Port number of gateway for this session. The port number should be unique across other sessions and XGCP/SRCP.
Remote Port Number	Port number of MGC for this session. The port number should be unique across other sessions and XGCP/SRCP.
Session State	State this session is in.
Current Session	Indicates which session has received an active message from MGC.
Local IP Address	IP address of gateway.
Remote IP Address	IP addressof the media gateway controller. It is resolved by using vismSessionGrpMgcNamein vismSessionGrpTable.
Max Window Size	Max size of the receive window in segments, used for flow control.
Max Attempts to Synchronize	Max number of attempts to synchronize with other side (MGC).
Max Segment Size	Max number of octets that can be received by the peer sending the SYN segment.
Max Auto Resets	Max number of consecutive auto reset that will be performed before a connection is reset.
Retransmission TimeOut (ms)	(in milliseconds) Timeout value for retransmission of unacknowledged packets.
Max Retransmits	Max number of times consecutive transmission will be attempted before the connection is considered broken.
Max Acknowlegements Accumulated	Indicates the maximum number of acknowledgments that will be accumulated before sending an acknowledgment if another segment is not sent.

Table 6-54 Field Descriptions for the VXSM Create RUDP Session Window (continued)

Field Name	Description
Accumulated Acknowledgement TimeOut (ms)	(in milliseconds) Timeout value for sending an acknowledgment segment if another segment is not sent.
Max Number Of Out Of Sequence Packets	Max number of out of sequence packets that will be accumulated before an EACK segment is sent. The EACK segment is used to acknowledge segments received out of sequence.
Send Null Segment Timeout (ms)	Number of milliseconds of idle time before sending a null segment.
Auto Reset Timeout (ms)	Number of milliseconds to wait for transfer state before an auto reset occurs.

6.7.7.2 Configuring Voiceband Data

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click the VXSM card.

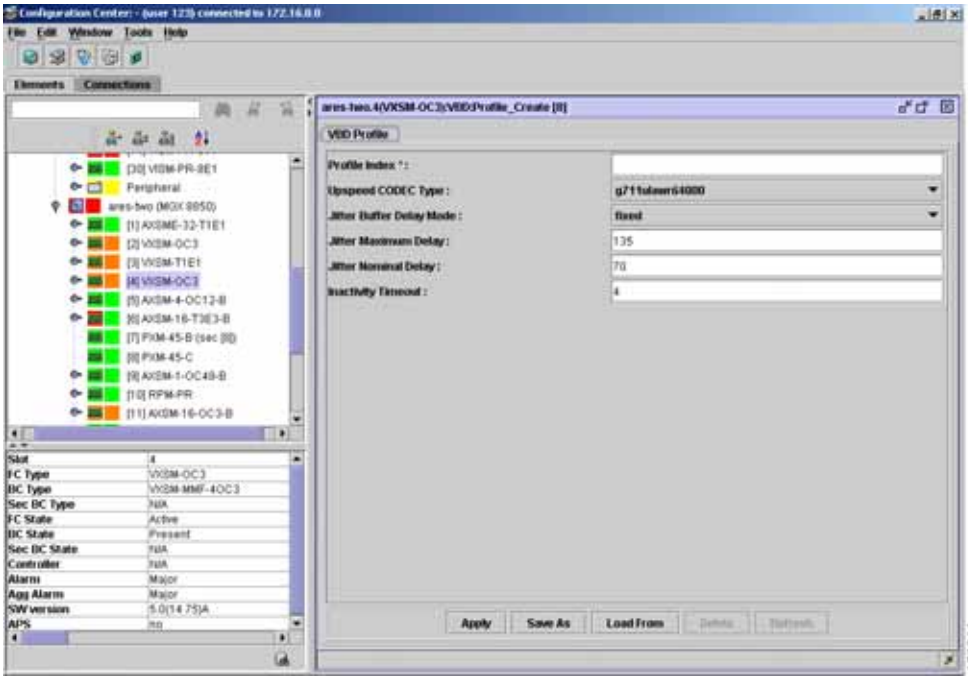
Step 3 Click the **VBD** tab.

Step 4 Create a profile:

a. Choose the **Profile** option from the **Category** drop-down arrow.

b. Click **Create**. The Create VBD Profile window appears.

Figure 6-53 Configuration Center—VXSM Create VBD Profile Window



c. Configure the fields.

Note Table 6-55 describes the fields in the VXSM Create VBD Profile window.

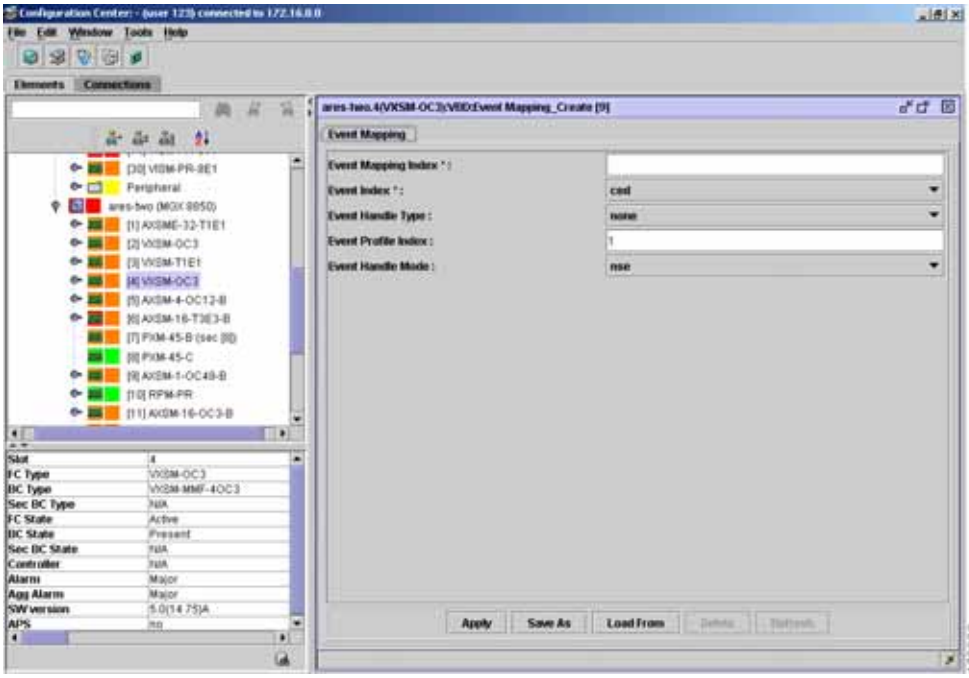
d. Click **Apply** to create the VBD profile.

Step 5 Create two event mapping indexes:

a. Choose the **Event Mapping** option from the **Category** drop-down arrow.

b. Click **Create**. The Create Event Mapping window appears.

Figure 6-54 Configuration Center—VXSM Create Event Mapping Window



c. Configure the fields. Make sure to create one **Event Index** as **ced**, and a second **Event Index** as **v21Tone**.

Note Table 6-56 describes the fields in the VXSM Create Event Mapping window.

d. Click **Apply** to create one event mapping index. Perform Step 5 again, and create a second index.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-55 Field Descriptions for the VXSM Create VBD Profile Window

Field Name	Description
Event Mapping Index	Index that uniquely identifies a set of voice data events supported and how they will be handled in the media gateway.
Event Index	Index that uniquely identifies the voice band data event.
Event Handle Type	Specifies the type of the handle function in response to this event detection.
Event Profile Index	Specifies the index of the profile which defines the handling attributes in response to the event detection.
Event Handle Mode	Specifies the handling mode of the event.

Table 6-56 Field Descriptions for the VXSM Create Event Mapping Window

Field Name	Description
Profile Index	This object uniquely identifies the VBD profile.
Upspeed CODEC Type	Specifies the CODEC type to use for upspeed.
Jitter Buffer Delay Mode	Specifies the jitter buffer mode applied to the VBD call connection.
Jitter Maximum Delay	Specifies the maximum jitter buffer size in the VBD connection.
Jitter Nominal Delay	Specifies the nominal jitter buffer size in the VBD connection.
Inactivity Timeout	Specifies the maximum jitter buffer size in the VBD connection.

6.7.7.3 Creating PRI-BH

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

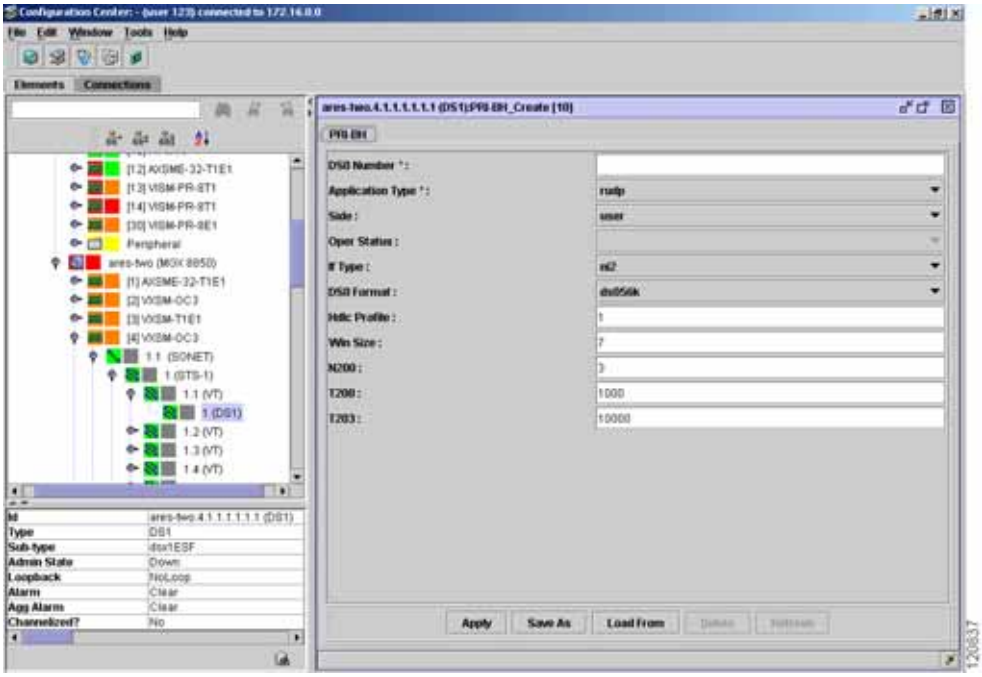
Step 2 Within the node, expand the VXSM OC3 card and expand the SONET line, STS path, and VT path that contain the DS1/E1 line you want to enable. Double-click on the DS1/E1 line. The DS1/E1 Path tab appears, with the DS1/E1 Line Info option selected by default

Step 3 Within the **Elements** tab, within the node, expand the VXSM card, and double-click on the DS1/E1 line you want to create PRI-BH under.

Step 4 Click the **PRI-BH** tab.

Step 5 Click **Create**. The VXSM PRI-BH Create window appears.

Figure 6-55 Configuration Center—VXSM PRI-BH Create Window



Step 6 Configure the fields.

Note Table 6-57 describes the fields in the VXSM PRI-BH Create window.

Step 7 Click **Apply** to create PRI-BH.

Table 6-57 Field Descriptions for the VXSM PRI-BH Create Window

Field Name	Description
DS0 Number	DS0 number.
Application Type	Specifies the application type for the corresponding LAPD D channel. After the LAPD is added, this object can not be modified.
Side	Specifies whether the LAPD stack is at the user or network side.
Oper Status	Operational status of this interface.
If Type	Specifies the type of interface in which the LAPD stack resides.
DS0 Format	Specifies the DS0 format. 56k is robbed-bit for T1.
Hdlc Profile	Specifies the HDLC profile which contains a list of HDLC attributes for the PRI backhaul connection.
Win Size	Specifies the maximum number of sequentially numbered l-frames that may be outstanding.
N200	Specifies the maximum number of retransmissions of a frame.

Table 6-57 Field Descriptions for the VXSM PRI-BH Create Window (continued)

Field Name	Description
T200	Specifies the maximum time to wait for acknowledgment of a transmit frame.
T203	Specifies the maximum time in milliseconds allowed without frames being exchanged. This value should be greater than the value for T200.

6.7.7.4 Configuring Announcements

In switching mode, VXSM delivers prerecorded announcements in either direction, for example, a calling party or called party, under the control of the MGC. These announcements are played during a call setup and after the call is established. The announcement files are available in VXSM memory to be played out. If the file does not reside in VXSM memory, VXSM uses TFTP to obtain the file from an external announcement server, caches it, and plays it out.

A media gateway is a network element. It provides an electrical conversion between audio signals carried on telephone circuits and data packets carried over the Internet or over other packet data networks. To setup an announcement system, the media gateway plays prerecorded audio files. These files are played bidirectionally over existing connections, for example, calls, or the audio files are directed toward a TDM network to a TDM endpoint that is terminated on a media gateway.

To configure the announcement control parameters:

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VXSM card.

Step 3 Click the **VOICE Features** tab.

Step 4 Choose the **Announcement Controls** option from the **Category** drop-down arrow.

Step 5 Configure the fields.

Note Table 6-58 describes fields in the VXSM Voice Features tab, Announcement Controls category.

Step 6 Click **Apply** to configure the announcement controls.

Table 6-58 Field Descriptions for the VXSM Voice Features Tab, Announcement Controls Category

Field Name	Description
Announcement Server Domain Name	Specifies the domain name of an announcement file server that resides in an IP network and is reachable from the media gateway. The default value of this object is NULL string (size is 0). Before using any object in this table, this object should be configured to non-NULL.
Domain Name Resolution	Specifies the domain name resolution for the domain name of the announcement file server which is specified by the Audio File Name object. If this object is set to internalOnly, the IP address associated with the file server (Audio File Name) will be determined by the cannoIpAddress object. Values include: • internalOnly (default)—Specifies the internal resolution of the domain name for the announcement file server. If the **internalOnly** option is chosen, the IP address associated with the file server is determined according to the IP address of the server. • externalOnly—Specifies the external resolution of the domain name for the announcement file server.
Server IP Address Type	Specifies the IP address type of cannoIpAddress. This object is not applicable when Domain Name Resolution is set to externalOnly.
Server IP Address	Specifies the IP address type associated with the Audio File Name. This object is not applicable when Domain Name Resolution is set to externalOnly.
Ann File Age (minutes)	Specifies the maximum life span of the dynamic announcement files in the cache. A value of 0 indicates that the age time is disabled. The range is from 0-1440 min. The default value is 1440 min.
Directory Path	Specifies the directory path under the default TFTP directory in the announcement file server for announcement files. The characters can be alphanumeric characters, forward slashes, backward slashes, periods, dashes, and underscores. No embedded spaces are allowed. The subdirectory path can have up to 64 characters in length.
Request TimeOut (seconds)	Specifies the time for a play announcement request to be serviced. The range is from 1-50 sec. The default value is 5 sec.
Max Announcement Number	Specifies the maximum number of permanent announcement files that can be added to the media gateway. A value of 0 indicates that the media gateway supports only dynamic announcement files. The range is from 0-136. The default value is 41.

To map an announcement name number to the announcement filename:

Step 1 Within the **VOICE Features** tab, choose the **Announcement Files** option from the **Category** drop-down arrow.

Step 2 Click **Create** to display the Announcement Files Configuration window.

Step 3 Configure the fields.

Note Table 6-58 describes fields in the VXSM Voice Features tab, Announcement Files category.

Step 4 Click **Apply** to map the announcement name number to the announcement filename.

Table 6-59 Field Descriptions for the VXSM Voice Features Tab, Announcement Files Category

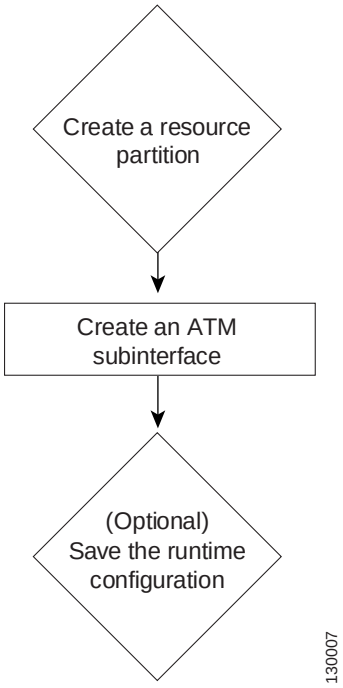
Field Name	Description
File Number	Index value to identify the announcement file that is used by the media gateway. The range is from 1-1024.
File Name	Name of a valid announcement that is stored in the media gateway announcement table. The announcement file name is composed of up to 64 characters, and can incorporate path or subdirectory information. The characters can be alphanumeric characters, forward slashes, backward slashes, periods, dashes, and underscores. No embedded spaces are allowed. The last character of the filename cannot have a dash or forward slash.
File Status	Status of the audio file.
Number of Play Cycles	Number of times that the announcement file is played. The range is from 0-65535 cycles. The default is one cycle. The value zero indicated that an announcement file is played or looped continuously. **Note** The Number of Play Cycles parameter is used only when the play announcement signal from the MGC does not incorporate a parameter, which specifies the number of cycles that the announcement is played.
Play Duration (10 milliseconds)	Duration that the announcement file is played during an announcement cycle. The range is from 0-65535 ms. The default value is zero. The value zero indicates that the duration of the announcement is a variable, and the Number of Cycles parameter determines the time. **Note** The **Play Duration (10 milliseconds)** field is applicable only for playing a fixed announcement. To play a fixed announcement, the **Number of Cycles** parameter and the **Play Duration** parameter are used together to determine how long the announcement is played.

Table 6-59 Field Descriptions for the VXSM Voice Features Tab, Announcement Files Category (continued)

Field Name	Description
File Type	Announcement file type. Values include: • **dynamic** (default)—specifies the dynamic file is removed from the cache when the age of the file reaches a specified limit or in accordance with a Least Replaceable Unit (LRU) algorithm when the cache is full. • **permanent**—specifies the permanent file is stored in the cache until it is deliberately deleted.
Aging Time (minutes)	Announcement file age in cache, only for dynamic files.

6.8 How Do I Configure RPM Cards?

Figure 6-56 Process for Configuring RPM Cards



To configure RPM-PR or RPM-XF cards, complete the following steps:

Step 1 Create a resource partition—See 6.8.1 Creating a Resource Partition for RPM, page 6-117.

Step 2 Create an ATM subinterface—See 6.8.2 Creating or Modifying an ATM Subinterface, page 6-119.

Step 3 (Optional) Save the run-time configuration—See 6.8.3 Saving the Run-Time Configuration for RPM, page 6-120.

6.8.1 Creating a Resource Partition for RPM

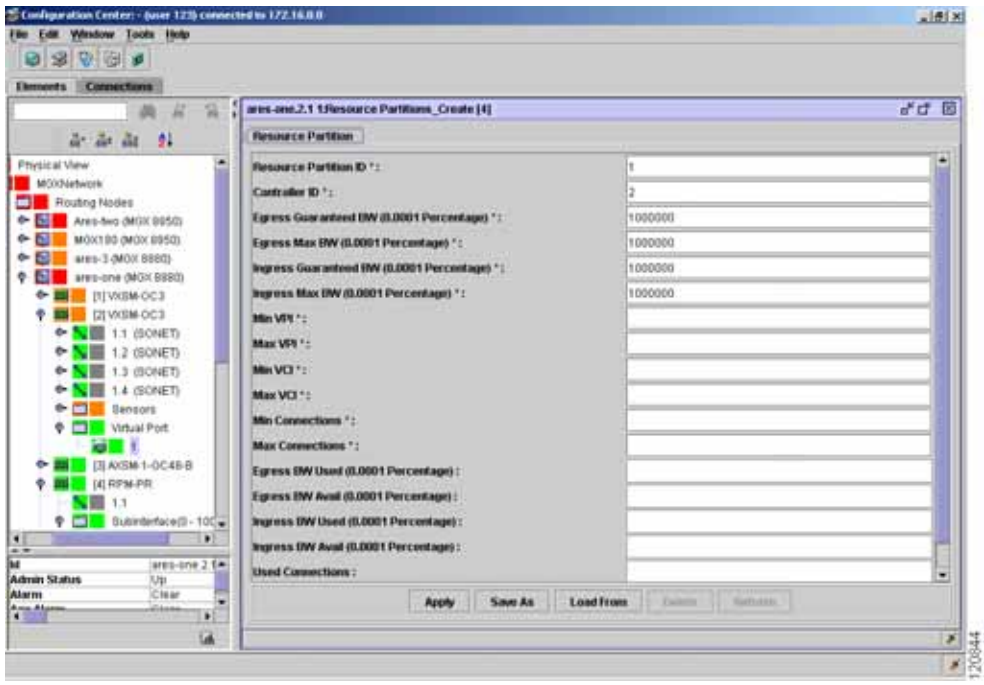
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the RPM card.

Step 3 Click the **Resource Partitions** tab.

Step 4 Click **Create**. The Create Resource Partitions window appears.

Figure 6-57 Configuration Center—RPM Create Resource Partitions Window



Step 5 Configure the fields.

Note Table 6-60 describes fields in the RPM Create Resource Partitions window.

Step 6 Click **Apply** to create the resource partition.

Table 6-60 Field Descriptions for the RPM Create Resource Partitions Window

Field Name	Description
Partition Type (*RPM-PR only*)	Partition type, can be VCC or VPC.
Resource Partition ID	Value for the resource partition identifier. The range is from 1-10. The value 1 is reserved for PNNI.

Table 6-60 Field Descriptions for the RPM Create Resource Partitions Window (continued)

Field Name	Description
Controller ID	Value for the controller identifier. The range is from 2-255. The value 2 is reserved for PNNI, the others are for LSC.
Egress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in egress direction. The range is from 0-1000000.
Egress Max BW	Maximum percentage bandwidth for the resource partition in egress direction. The range is from 0-1000000.
Ingress Guaranteed BW	Guaranteed percentage bandwidth reserved for the resource partition in ingress direction. The range is from 0-1000000.
Ingress Max BW	Maximum percentage bandwidth for the resource partition in ingress direction. The range is from 0-1000000.
Min VPI	Beginning of the VPI range for this partition. • For RPM-PR VCC partitions, the range is 0-0. • For RPM-PR VPC partitions, the range is 1-255. • For RPM-XF, the range is 0-240. • For VXSM, the range is 0-255.
Max VPI	End of the VPI range for this partition. • For RPM-PR VCC partitions, the range is 0-0. • For RPM-PR VPC partitions, the range is 1-255. • For RPM-XF, the range is 0-240. • For VXSM, the range is 0-255.
Min VCI	Beginning of the VCI range for this partition. • For RPM-PR VCC partitions, the range is 32-3808. • For RPM-PR VPC partitions, the range is 0-0. • For RPM-XF, the range is 32-65535.
Max VCI	End of the VCI range for this partition. • For RPM-PR VCC partitions, the range is 32-3808. • For RPM-PR VPC partitions, the range is 65535-65535. • For RPM-XF, the range is 32-65535.
Min Connections	Guaranteed number of connections that can be configured on this partition.
Max Connections	Maximum number of connections that can be configured on this partition.
Egress BW Used	Percentage bandwidth used by the resource partition in egress direction.
Egress BW Avail	Percentage bandwidth available on the resource partition in egress direction.
Ingress BW Used	Percentage bandwidth used by the resource partition in ingress direction.
Ingress BW Avail	Percentage bandwidth available on the resource partition in ingress direction.
Used Connections	Number of connections currently in use on this partition.
Avail Connections	Number of connections available that can be added on this partition.

6.8.2 Creating or Modifying an ATM Subinterface

By preparing to create the master end of the connection to the VXSM card, you must create an ATM subinterface on the RPM card.

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the RPM card.

Step 3 Click the **Ports** tab to display the entries for the Ports Table for RPM.

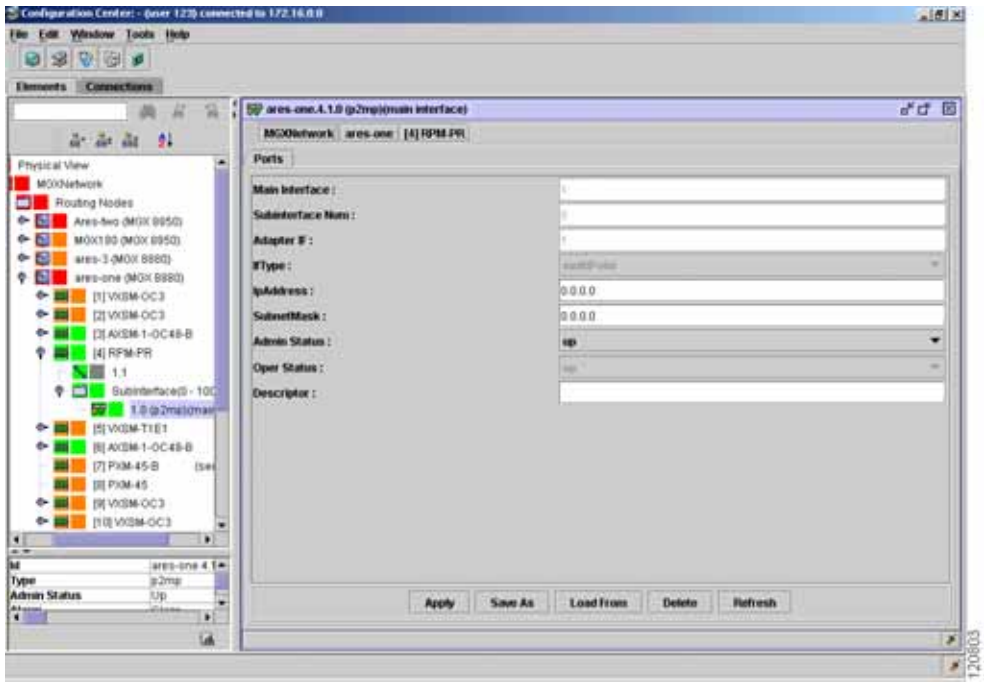
Step 4 To modify an existing entry, select the entry, then click **Details**

or

To create a new ATM subinterface, click **Create**.

The Ports Create/Details window appears.

Figure 6-58 Configuration Center—RPM Ports Create/Details Window



Step 5 Configure the fields.

Note Table 6-61 describes fields in the RPM Ports Create/Details window.

Step 6 Click **Apply** to create the resource partition.

After creating the ATM subinterface, you must create a gigabit Ethernet interface to the network. For information about creating the gigabit Ethernet interface, refer to the *VXSM Configuration Guide and Command Reference for MGX Switches and Media Gateways, Release 5*.

Table 6-61 Field Descriptions for the RPM Ports Create/Details Window

Field Name	Description
Main Interface	Specifies the main interface.
Subinterface Num	Specifies the subinterface.
Adapter IF	Maps to the RPMs port adapter interface. Currently only one port adapter interface (switch 1) is supported.
IfType	Specifies the link type of this subinterface.
IP Address	Specifies the 4-octet IP address of this subinterface. The IP address is the same as the one used to set up the slave end of the connection on the VXSM card.
Subnet Mask	Specifies the 4-octet subnet mask of this subinterface. An example subnet mask is 255.255.255.0.
Admin Status	Specifies the administrative status of this subinterface.
Oper Status	Current operational state of the subinterface.
Descriptor	Port descriptor.

6.8.3 Saving the Run-Time Configuration for RPM

Once you make any changes to the RPM card, such as creating or modifying a resource partition or an ATM subinterface, or adding connections to the RPM card, to make your changes permanent and survive after a reboot, you must save the run-time configuration on the RPM card.

Note For details on adding connections, see Chapter 7, "Provisioning Connections."

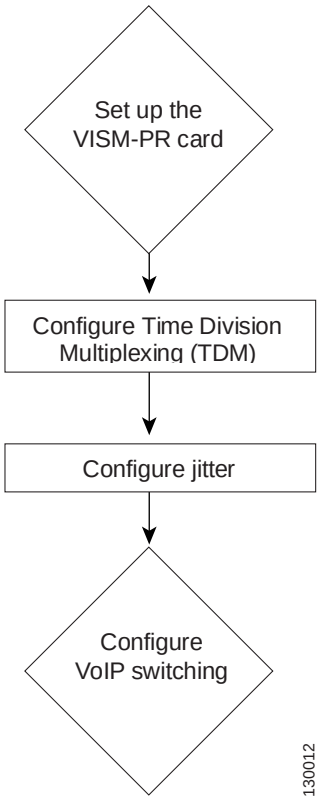
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the RPM card. The **Card** tab appears, with the **Front Card Configuration** category selected by default.

Step 3 Click the **Save Running Config** button. The status of the operation appears in the lower left of the window.

6.9 How Do I Configure VISM-PR Cards?

Figure 6-59 Process for Configuring VISM-PR Cards



In order to configure Voice Inter-working Service Module Premium (VISM-PR) cards, you must perform the following steps:

Step 1 Set up the VISM-PR card—See 6.9.1 Setting Up a VISM-PR Card, page 6-122.

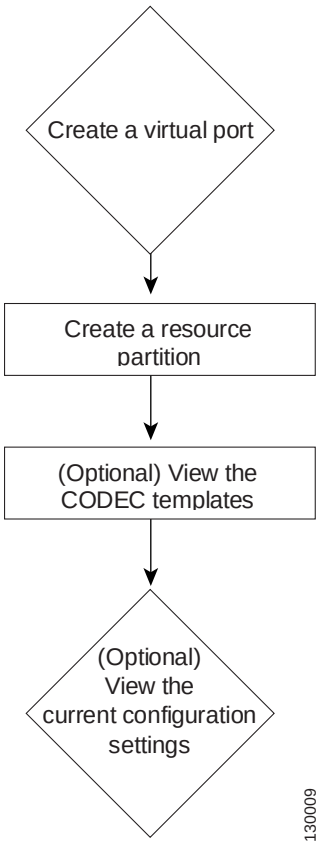
Step 2 Configure Time Division Multiplexing (TDM)—See 6.9.2 Configuring TDM for VISM-PR, page 6-130.

Step 3 Configure jitter—See 6.9.3 Configuring Jitter on VISM-PR Cards, page 6-141.

Step 4 Configure VoIP switching—See 6.9.4 Configuring VoIP Switching for VISM-PR, page 6-143.

6.9.1 Setting Up a VISM-PR Card

Figure 6-60 Process for Setting Up a VISM-PR Card



In order to set up a VISM-PR card, you must perform the following steps:

Step 1 Create a virtual port—See 6.9.1.1 Creating a Virtual Port for VISM-PR, page 6-123.

Step 2 Create a resource partition—See 6.9.1.2 Creating a Resource Partition for VISM-PR, page 6-124.

Step 3 (Optional) View the CODEC templates—See 6.9.1.3 Viewing VISM-PR CODEC Templates, page 6-125.

Step 4 (Optional) View the current configuration settings—See 6.9.1.4 Viewing VISM-PR Card Configuration Settings, page 6-128.

6.9.1.1 Creating a Virtual Port for VISM-PR

Note Only one virtual port is allowed on a VISM-PR card.

To create a virtual port for the VISM-PR card:

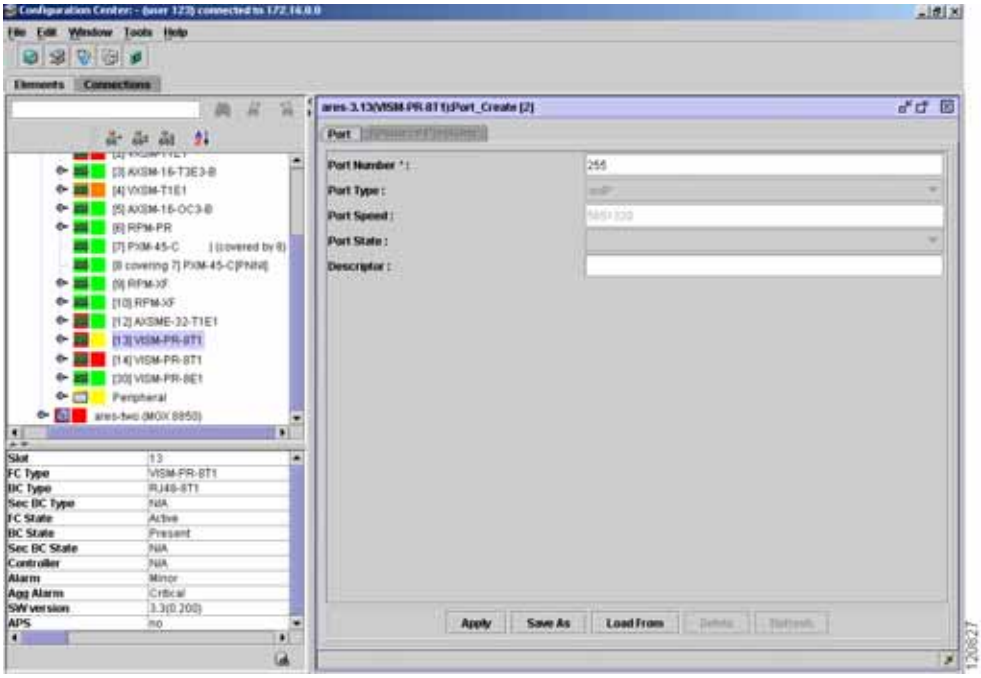
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Port** tab to display the port table.

Step 4 Click **Create** to display the Create Port window.

Figure 6-61 Configuration Center—VISM-PR Create Port Window



Step 5 Complete the fields.

Note When you create an ATM port on a VISM-PR card, the bandwidth, VPI range, and VCI range are determined.

Step 6 Click **Create** to create a virtual port for VISM-PR.

The added port is not detected by the controller until you create a resource partition. For more information, see section 6.9.1.2 Creating a Resource Partition for VISM-PR, page 6-124.

Table 6-62 Field Descriptions for the VISM-PR Create Port Window

Field Name	Description
Port Number	Virtual port number for the VISM-PR card.
Port Type	Indicates the network port. Value of this object is always set to VoIP.
Port Speed	Advertises virtual port bandwidth to the controller, SVC and PVC connection admission control, and aggregate traffic clipping.
Port State	Current state of the port.
Descriptor	Port descriptor.

6.9.1.2 Creating a Resource Partition for VISM-PR

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Port** tab to display the entries of the port table.

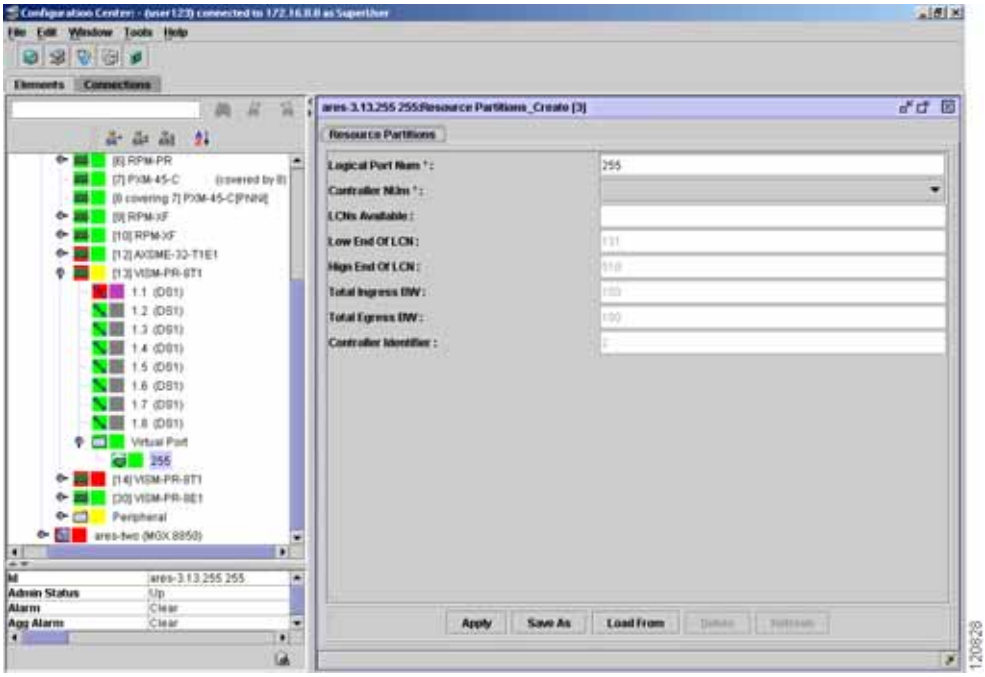
Step 4 Select the port entry.

Step 5 Click **Details**.

Step 6 Click the **Resource Partition** tab to display the resource partition table for VISM-PR.

Step 7 Click **Create** to display the Create Resource Partitions window.

Figure 6-62 Configuration Center—VISM-PR Create Resource Partitions Window



Step 8 Complete the fields.

Note Table 6-63 describes fields in the VISM-PR Create Resource Partitions window.

Step 9 Click **Apply** to create the resource partition.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9

Table 6-63 Field Descriptions for the VISM-PR Create Resource Partitions Window

Field Name	Description
Logical Port Num	Index to this table.
Controller Num	Index for the controller using the port. In MGX release 1.0, the value par should be used.
LCNs Available	Number of LCNs available for this controller and this port.
Low End of LCN	Low end of reserved LCN. Currently SET is not allowed on this object.
High End of LCN	High end of reserved LCN.
Total Ingress BW	Percentage of total ingress bandwidth reserved. Since we have only one LCN for VoIP, the value is 100.
Total Egress BW	Percentage of total egress bandwidth reserved. Since we have only one LCN for VoIP, the value is 100.
Controller Identifier	Controller identifier of the PNNI controller.

6.9.1.3 Viewing VISM-PR CODEC Templates

Viewing VISM-PR CODEC templates in Cisco MGM can be done in two ways:

You can view a list of all possible CODEC templates on the VISM-PR card

or

You can view the current CODEC template being used on the VISM-PR card.

Note To change the CODEC templates, you must use the CLI. For details, refer to the *Cisco Voice Interworking Services (VISM) Configuration Guide & Command Reference, Release 3.3*.

To view a list of all possible CODEC templates on the VISM-PR card:

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **CODECs** tab. The **CODECs Supported** category appears by default. All supported CODEC templates are listed in the table.

Note To view and configure VoIP CODECs, see section 6.9.1.3.1 Configuring VoIP CODECs, page 6-127.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

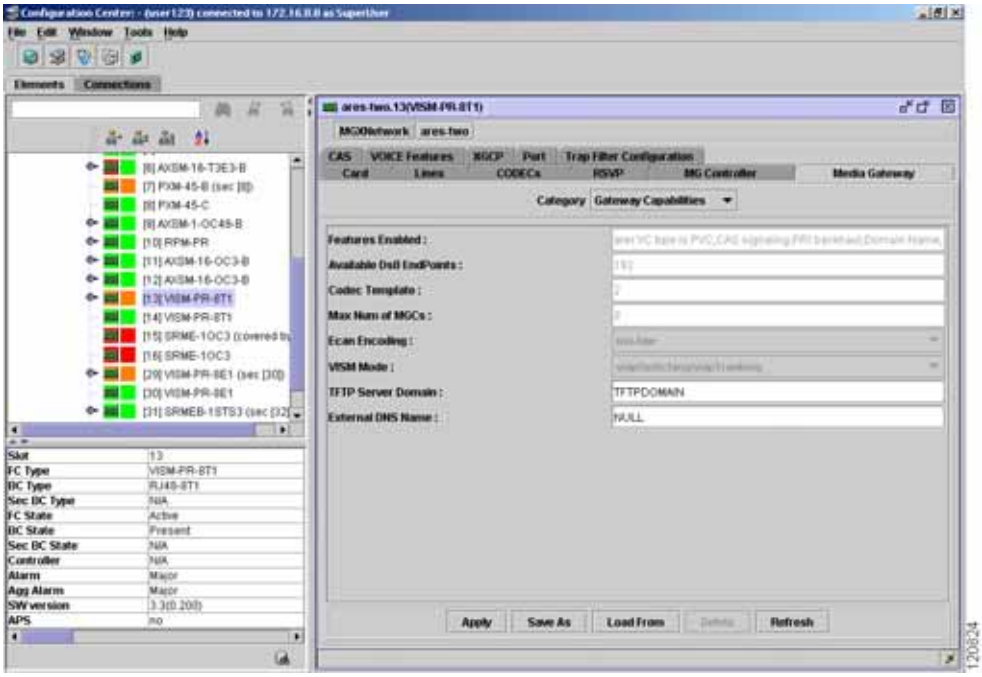
To view the current CODEC template in use on the VISM-PR card:

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Media Gateway** tab. The **Gateway Capabilities** option appears by default in the **Category** drop-down arrow. The **Codec Template** field lists the number of the current CODEC template in use on the VISM-PR card.

Figure 6-63 Configuration Center—VISM-PR Media Gateway Tab, Gateway Capabilities Category



Note Table 6-65 describes fields in the VISM-PR Media Gateway tab, Gateway Capabilities category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

6.9.1.3.1 Configuring VoIP CODECs

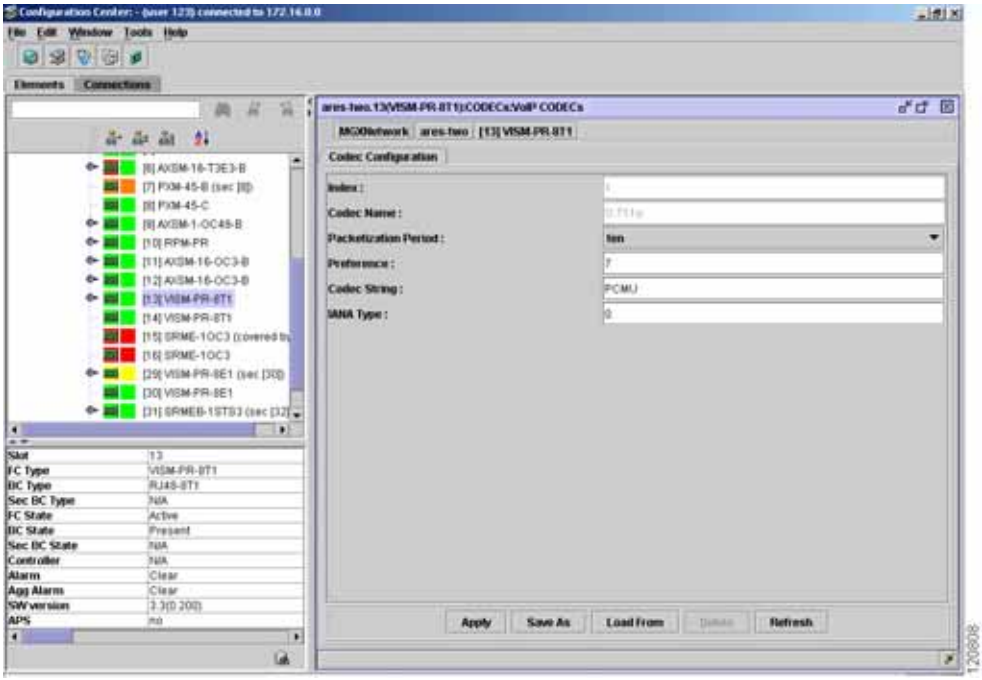
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **CODECs** tab. Choose the **VoIP CODECs** option from the **Category** drop-down arrow.

Step 4 Click on the CODEC you want to configure, then click **Details**. The Codec Configuration window appears.

Figure 6-64 Configuration Center—VISM-PR Codec Configuration Window



Step 5 Complete the fields.

Note Table 6-64 describes the fields in the VISM-PR Codec Configuration window.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Step 6 Click Apply to configure the VoIP CODEC.

Table 6-64 Field Descriptions for the VISM-PR Codec Configuration Window

Field Name	Description
Index	Index to this table.
Codec Name	Name of the codec (for example, index 1 will have G.711u as the codec name; index 2 will have G.711a as the codec name, etc.).
Packetization Period	Packetization period for a particular CODEC in milliseconds.
Preference	User configured preference for each CODEC.
Codec String	Local connection option or SDP descriptor string that VISM-PR obtains from the call agent for the CODEC.
IANA Type	Contains a number assigned by IANA.

6.9.1.4 Viewing VISM-PR Card Configuration Settings

The Gateway Capabilities option allows you to view VISM-PR card configuration details, such as the VISM mode, ECAN encoding, and current CODEC templates.

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Media Gateway** tab. The **Gateway Capabilities** option appears by default in the **Category** drop-down arrow (see Figure 6-63).

Note Table 6-65 describes fields in the VISM-PR Media Gateway tab, Gateway Capabilities category.

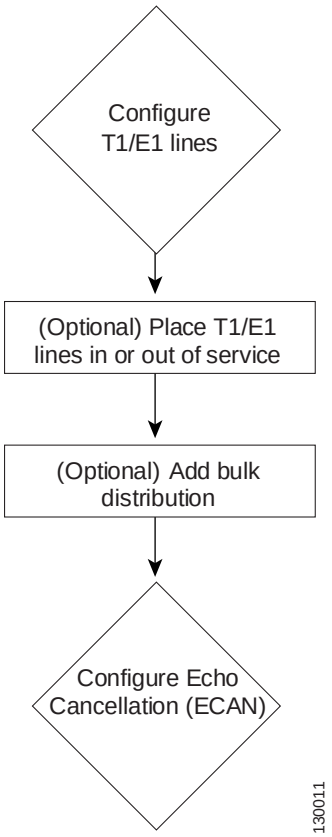
For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-65 Field Descriptions for the VISM-PR Media Gateway Tab, Gateway Capabilities Category

Field Name	Description
Features Enabled	Features enabled on this VISM-PR card.
Available Ds0 EndPoints	Number of DS0s available for new connections on VISM-PR. This is modified by the VISM-PR firmware after each connection is setup.
Codec Template	Number of the CODEC template currently configured on the VISM-PR card.
Max Num of MGCs	Maximum number of MGCs that the MG can be configured with. If the value is 0, there is no limitation.
Ecan Encoding	Voice encoding type, can be either: • Mu-law—Value returned for T1 lines. • A-law—Value returned for E1 lines.
VISM Mode	Operating mode of the VISM-PR card.
TFTP Server Domain	Domain name of the TFTP server from where the CAS module will download the CAS files.
External DNS Name	Refers to the domain name of the external DNS server that will be used to resolve other domain name.

6.9.2 Configuring TDM for VISM-PR

Figure 6-65 Process for Configuring TDM for VISM-PR



In order to configure the Time Division Multiplexing (TDM) on a VISM-PR card, you must perform the following steps:

Step 1 Configure T1/E1 lines—See 6.9.2.1 Configuring T1 and E1 Lines for VISM-PR, page 6-131).

Step 2 (Optional) Place T1/E1 lines in or out of service—See 6.9.2.2 Placing T1 or E1 Lines In or Out of Service, page 6-139.

Step 3 (Optional) Add bulk distribution—See 6.9.2.3 Adding Bulk Distribution Using SRME, page 6-139.

Step 4 Configure Echo Cancellation (ECAN)—See 6.9.2.4 Configuring ECAN for VISM-PR, page 6-141.

6.9.2.1 Configuring T1 and E1 Lines for VISM-PR

You can have eight physical T1 or E1 ports on the VISM-PR back card.

For detailed information on how to configure CAS signaling for the TDM side of the network application, refer to the *Cisco Voice Interworking Services (VISM) Configuration Guide and Command Reference, Release 3.3*

To configure T1 and E1 lines on VISM-PR, complete the following steps:

Step 1 Add a T1 or E1 line—See 6.9.2.1.1 Adding a T1 or E1 Line, page 6-131.

Step 2 Configure signaling on the T1 or E1 line—See 6.9.2.1.2 Configuring Signaling on the T1 or E1 Line, page 6-133.

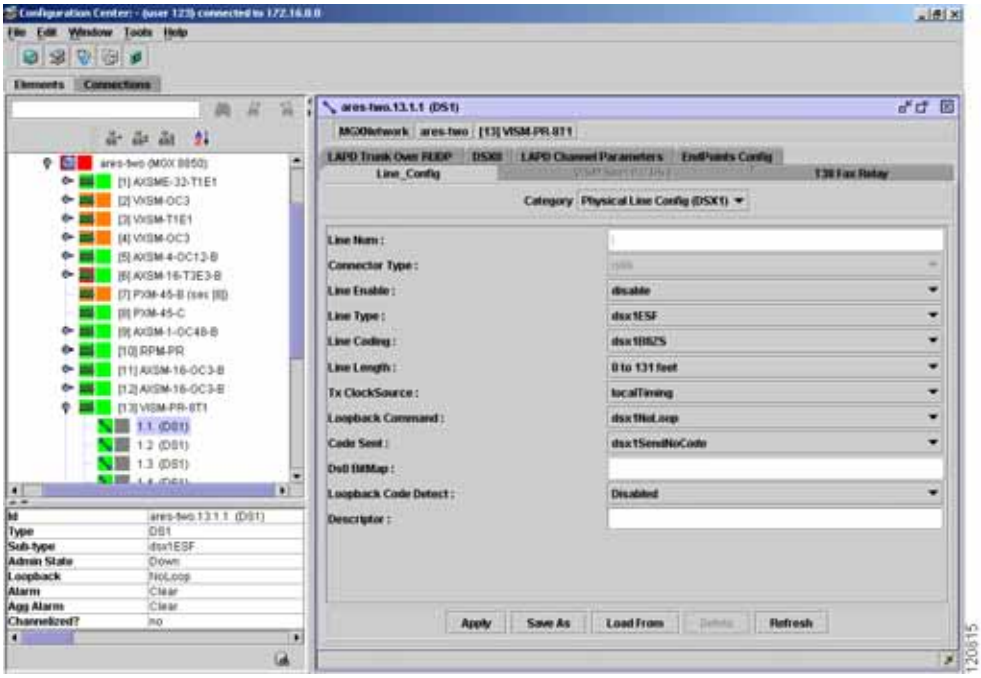
Step 3 Configure alarm conditioning handling on the T1 or E1 line—See 6.9.2.1.3 Configuring Alarm Conditioning Handling on the T1 or E1 Line, page 6-136.

6.9.2.1.1 Adding a T1 or E1 Line

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card. The **Line Config** tab appears by default, with the **Physical Line Config (DSX1)** option selected in the **Category** drop-down arrow.

Figure 6-66 Configuration Center—VISM-PR Line Config Tab, Physical Line Config (DSX1) Category



Step 3 Choose one of the following options to enable or disable the line in the **Line Enable** drop-down arrow:

- **disable**
- **enable**
- **modify**

Step 4 Configure additional parameters as desired.

Note Table 6-66 describes fields in the VISM-PR Line Config tab, Physical Line Config (DSX1) category.

Step 5 Click **Apply** to add the T1 or E1 line.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-66 Field Descriptions for the VISM-PR Line Config Tab, Physical Line Config (DSX1) Category

Field Name	Description
Line Num	Identifier of a DS1/E1 interface on a managed device. Should have the same value as ifIndex, if any entry for this interface exists in ifTable.
Connector Type	Indicates the connector as well as the backcard type. Has no significance for VHS.
Line Enable	Disables, enables or modifies a line.
Line Type	Indicates the variety of DS1 line implementing this circuit. Values include: • dsx1ESF—Extended SuperFrame DS1 (T1.107) • dsx1D4—AT&T D4 format DS1 (T1.107) • dsx1E1 • dsx1E1CRC • dsx1E1MF • dsx1E1CRC-MF • dsx1E1clearchannel • dsx1E1Q50 • dsx1E1Q50CRC
Line Coding	Describes the variety of zero code suppression used on the link.
Line Length	This is not a standard RFC 1407 variable, it is specific to BASIS implementation.
Tx Clock Source	Source of transmit clock. Values include: • localTiming • loopTiming

Table 6-66 Field Descriptions for the VISM-PR Line Config Tab, Physical Line Config (DSX1) Category (continued)

Field Name	Description
Loopback Command	Loopback configuration of the DS1 interface. Values include: • dsx1NoLoop • dsx1RemoteLoop • dsx1LocalLoop • dsx1PayloadLoop
Code Sent	Indicates the type of code being sent across the DS1 interface by the device. Values include: • dsx1SendNoCode • dsx1SendLineCode • dsx1SendPayloadCode • dsx1SendResetCode
Ds0 BitMap	Bit map of used DS0 for this line.
Loopback Code Detect	Disable or enable detection of line loopback codes.
Descriptor	Line descriptor.

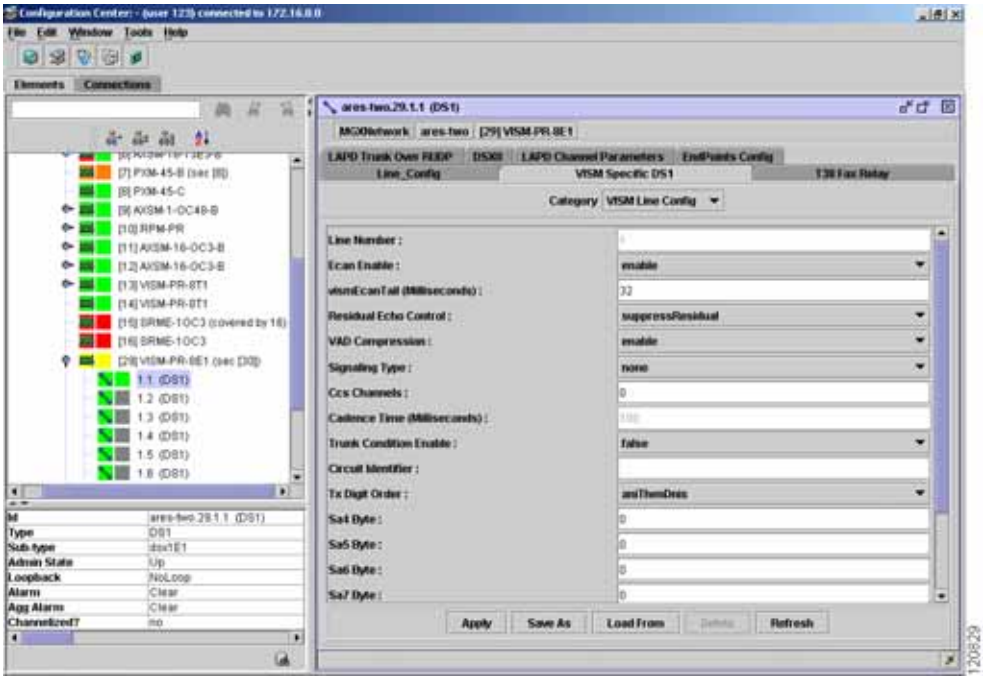
6.9.2.1.2 Configuring Signaling on the T1 or E1 Line

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **VISM Specific DS1** tab. The **VISM Line Config** option appears by default in the **Category** drop-down arrow.

Figure 6-67 Configuration Center—VISM-PR Specific DS1 Tab, VISM Line Config Category



Step 4 Choose one of the following options to configure signaling on the line in the **Signaling Type** drop-down arrow:

- **cas**
- **ccs**
- **none**

Step 5 Configure additional parameters as desired.

Note Table 6-67 describes fields in the VISM-PR Specific DS1 tab, VISM Line Config category.

Step 6 Click **Apply** to configure signaling on the T1 or E1 line.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-67 Field Descriptions for the VISM-PR Specific DS1 Tab, VISM Line Config Category

Field Name	Description
Line Number	T1/E1 line number.
Ecan Enable	Indicates whether the echo cancellation feature is enabled or disabled.
vismEcanTail (milliseconds)	Maximum tail. Should be set just higher than the worst rount trip delay anticipated. Convergence times might increase for longer tails, and more resources are used. The range is from 24-128. The following discrete values are allowed: • 24 • 32 • 48 • 64 • 80 • 96 • 112 • 128
Residual Echo Control	Residual Echo Control (REC) instructs the canceller how to treat echo remaining after cancellation. Values include: • **cancelOnly**—disables REC. • **suppressResidual**—specifies that the residual echo is replaced with silence. • **reserved**—results in a bad value error. • **comfortNoise** (default)—specifies that the noise is injected in place of residual echo at the same level as the ambient noise at the near end.
VAD Compression	Indicates whether Voice Activity Detection (VAD) is enabled or disabled on the compression DSPs.
Signaling Type	Indicates the type of signaling used on the line. Values include: • **cas**— defines Channel Associated Signaling (CAS). • **ccs**—defines Common Channel Signaling (CCS). • **none**—specifies that no signaling is used
Ccs Channels	Describes the CCS signaling channels or DS0s (also referred to as D-channel).
Cadence Time (milliseconds)	Describes the cadence time for CAS signals.
Trunk Condition Enable	Determines if the trunk conditioning should be enabled or disabled on this line.
Circuit Identifier	Identifier of a T1/E1 line. Contains alphanumeric description of a line for the purpose of better identification.
Tx Digit Order	Indicates the order in which ANIs and DNIs will be dialed out from this outgoing interface.

Table 6-67 Field Descriptions for the VISM-PR Specific DS1 Tab, VISM Line Config Category (continued)

Field Name	Description
Sa4 Byte	Spare bit on T1/E1 framer reserved for international standardization.
Sa5 Byte	
Sa6 Byte	
Sa7 Byte	
Sa8 Byte	
Line State	Allows the line administrative state (in service and out of service) to be persistent.
Admin State Control	This control object is used to change the service state of the line from is to coos or from coos to is. The resulting service state of the line is represented by vismDsx1State. inService: transition vismDsx1State to is. In the course, the MGs MGCs may get notified of this transition, e.g. in the case of MGCP through emission of RSIPs to registered call agents according to policy. forcefulOutOfService: Take the line out of service forcefully. This releases any resources at the line. In the course, the MGCs may get notified of this transition, e.g in the case of MGCP through emission of RSIPs to registered call agents according to policy. gracefulOutOfService: Take the line out of service gracefully. If there are no resources existing, vismDsx1State transitions to coos immediately. If resources exist, vismDsx1State transitions to poos thus initiating a graceful shutdown. In the course, the MGs MGCs may get notified of this transition, e.g. in the case of MGCP through emission of RSIPs to registered call agents according to policy.
Bearer Busy Code	Used when vismTrunkConditionEnable is enabled on a line. It is a configurable busy pattern sent out on the “Bearer” on the channels, which are receiving remote ATM channel ID (CID) alarms. If this object is not set, it assumes a default value of 255 for E1 and 127 for T1.

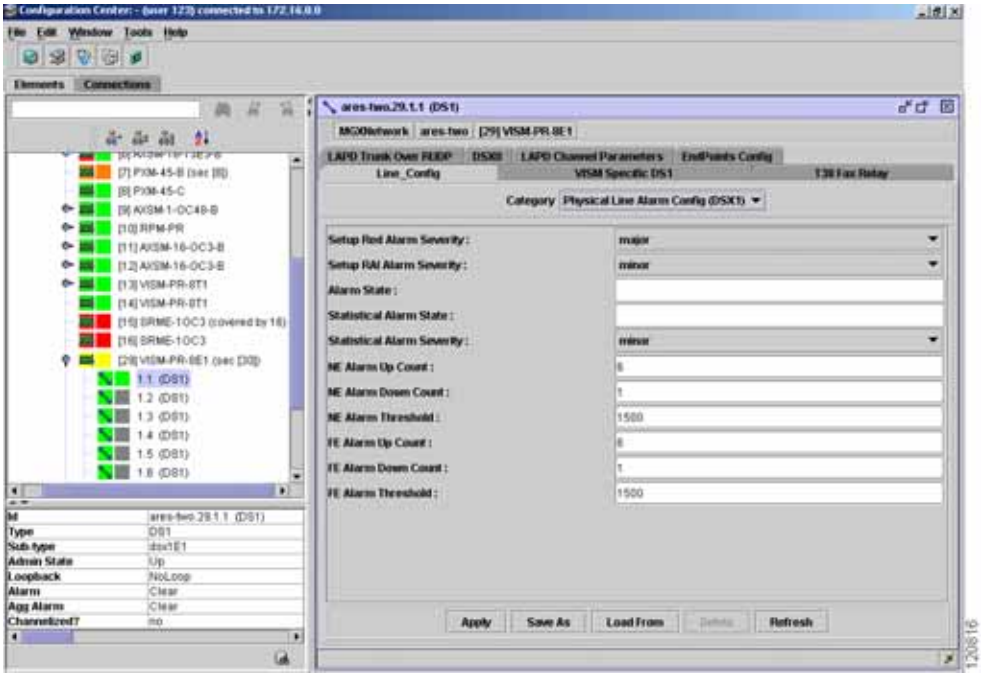
6.9.2.1.3 Configuring Alarm Conditioning Handling on the T1 or E1 Line

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card. The **Line Config** tab appears by default.

Step 3 Choose the **Physical Line Alarm Config (DSX1)** option from the **Category** drop-down arrow.

Figure 6-68 Configuration Center—VISM-PR Line Config Tab, Physical Line Alarm Config (DSX1) Category



Step 4 Configure the parameters as desired.

Note Table 6-68 describes fields in the VISM-PR Line Config tab, Physical Line Alarm Config (DSX1) category.

Step 5 Click **Apply** to configure alarm conditioning handling on the T1 or E1 line.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-68 Field Descriptions for the VISM-PR Line Config Tab, Physical Line Alarm Config (DSX1) Category

Field Name	Description
Setup Red Alarm Severity	Allows you to set up the severity of a RED alarm, so that when a LOS alarm is detected, VISM-PR will send the alarm with the appropriate severity status. Values include: • minor • major
Setup RAI Alarm Severity	Allows you to set up the severity of a RAI alarm, so that when a LOS alarm is detected, VISM-PR will send the alarm with the appropriate severity status. Values include: • minor • major
Alarm State	Bitmap of the DSX1 line alarms on the VISM-PR card.
Statistical Alarm State	Bitmap of the DSX1 line statistical alarms on the VISM-PR card.
Statistical Alarm Severity	Allows you to set up the severity of statistical alarms, so that when any statistical alarm is detected, VISM-PR will send the alarm with the appropriate severity status. Values include: • minor • major • inhibit
NE Alarm Up Count	Specifies the integration counter. The local alarms are LOS and LOF. Update the counter every 10 minutes to reach the threshold.
NE Alarm Down Count	Specifies the integration counter. The near-end alarms are LOS and LOF. Update the counter every 10 minutes to reach 0.
NE Alarm Threshold	Determines the value to declare near-end alarm. A count of 1500 gives 2.5 seconds to declare LOS with an up count value of six.
FE Alarm Up Count	Specifies the integration counter. The far-end alarms are AIS and YEL. Update counter every 10 minutes to reach the threshold.
FE Alarm Down Count	Specifies the integration counter. The far-end alarms are AIS and YEL. Update counter every 10 minutes to reach 0.
FE Alarm Threshold	Determines the value to declare far-end alarm. A count of 1500 gives 2.5 seconds to declare LOS with an up count value of six.

6.9.2.2 Placing T1 or E1 Lines In or Out of Service

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **VISM Specific DS1** tab. The **VISM Line Config** option appears by default in the **Category** drop-down arrow.

Note For a detailed description of the VISM Line Config option, see section 6.9.2.1.2 Configuring Signaling on the T1 or E1 Line, page 6-133.

Step 4 Choose the appropriate option from the **Admin State Control** drop-down arrow.

Note Table 6-67 describes fields in the VISM Specific DS1 tab, VISM Line Config category.

6.9.2.3 Adding Bulk Distribution Using SRME

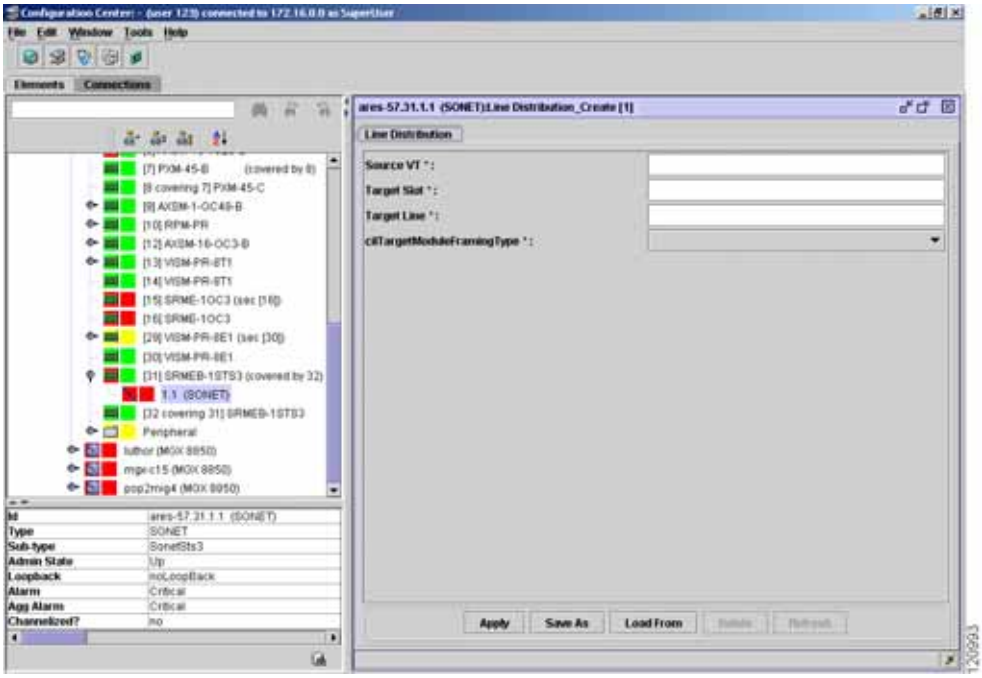
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the SONET line under the SRME card.

Step 3 Click the **Line Distribution** tab.

Step 4 Click **Create**. The Create Line Distribution window appears.

Figure 6-69 SRME Create Line Distribution Window



Step 5 Complete the fields.

Note Table 6-69 describes fields in the SRME Create Line Distribution window.

Step 6 Click **Apply** to add bulk distribution.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-69 Field Descriptions for the SRME Create Line Distribution Window

Field Name	Description
Source VT	Source VT for creation.
Target Slot	Target slot.
Target Line	Target line.
cilTargetModuleFramingType	Identifies the framing type of the target interface. The default value is Not Applicable.

6.9.2.4 Configuring ECAN for VISM-PR

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **VISM Specific DS1** tab. The **VISM Line Config** option appears by default in the **Category** drop-down arrow.

Note For a detailed description of the VISM Line Config option, see section 6.9.2.1.2 Configuring Signaling on the T1 or E1 Line, page 6-133.

Step 4 Choose the appropriate option from the **Ecan Enable** drop-down arrow.

Note Table 6-67 describes fields in the VISM Specific DS1 tab, VISM Line Config category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

6.9.3 Configuring Jitter on VISM-PR Cards

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

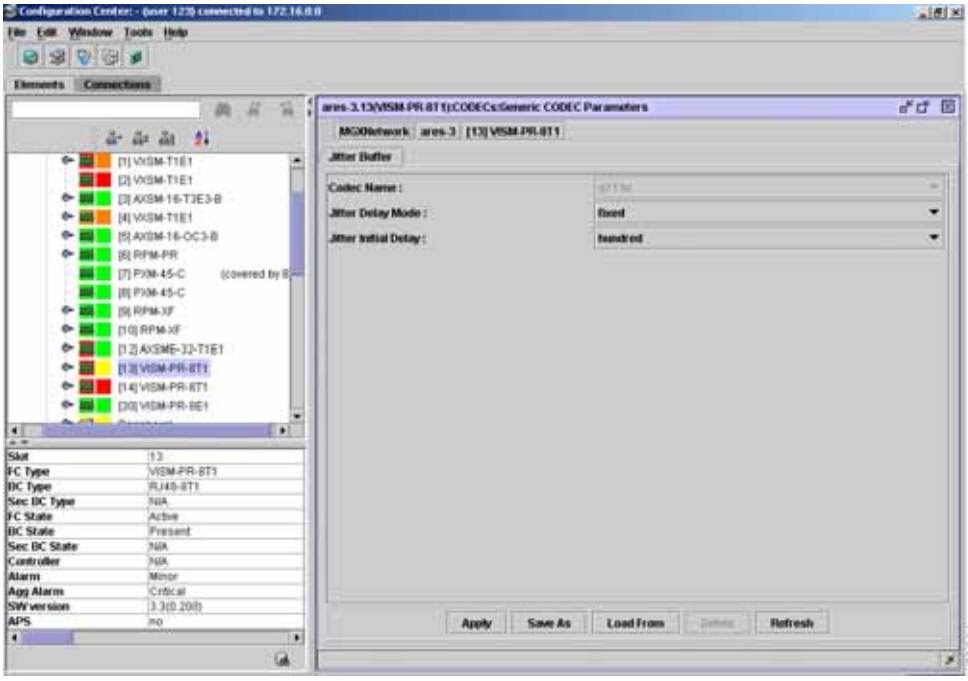
Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **CODECs** tab.

Step 4 Choose the **Generic CODEC Parameters** option from the **Category** drop-down arrow.

Step 5 Click on a CODEC entry, then click **Details**. The Jitter Buffer window appears.

Figure 6-70 Configuration Center—VISM-PR Jitter Buffer Window



Step 6 Complete the fields.

Note Table 6-70 describes fields in the VISM-PR Jitter Buffer window.

Step 7 Click **Apply** to configure the jitter parameters.

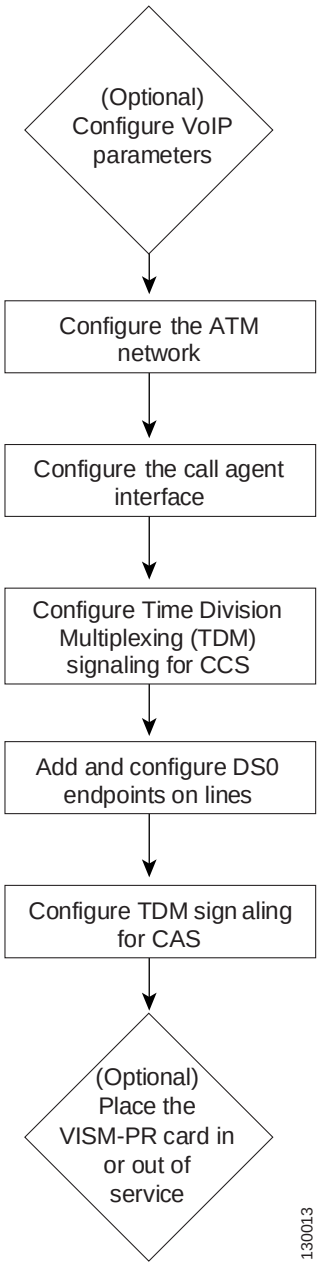
Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-70 Field Descriptions for the VISM-PR Jitter Buffer Window

Field Name	Description
Codec Name	Index to this table.
Jitter Delay Mode	Provisions the jitter buffer mode to be applied to a call connection. Values include: • fixed • adaptive • fixedWithTimeStamp
Jitter Initial Delay	Defines the jitter buffer size in milliseconds.

6.9.4 Configuring VoIP Switching for VISM-PR

Figure 6-71 Process for Configuring VoIP Switching for VISM-PR Cards



To configure VoIP switching for VISM-PR cards, complete the following steps:

Step 1 (Optional) Configure VoIP parameters—See 6.9.4.1 Configuring VoIP Parameters for VISM-PR, page 6-144.

Step 2 Configure the ATM network—See 6.9.4.2 Configuring the ATM Network for VISM-PR, page 6-146.

Step 3 Configure the call agent interface—See 6.9.4.3 Configuring the Call Agent Interface for VISM-PR, page 6-146.

Step 4 Configure Time Division Multiplexing (TDM) signaling for CCS—See 6.9.4.4 Configuring TDM Signaling for CCS on VISM-PR, page 6-173.

Step 5 Add and configure DS0 endpoints on lines—See 6.9.4.5 Adding and Configuring DS0 Endpoints on Lines, page 6-175.

Step 6 Configure TDM signaling for CAS—See 6.9.4.6 Configuring TDM Signaling for CAS on VISM-PR, page 6-180.

Step 7 (Optional) Place the VISM-PR card in or out of service—See 6.9.4.7 Placing the VISM-PR Card In or Out of Service, page 6-183.

6.9.4.1 Configuring VoIP Parameters for VISM-PR

To configure AAL5 PVCs on a VISM-PR card:

Step 1 From the Domain Explorer window, select the node from the Hierarchy pane and choose **Configuration > MGX 8880/8850 MG > Configuration Center**. The Configuration window for the selected node opens.

Step 2 Within the **Elements** tab, expand the node, then double-click the VISM-PR card.

Step 3 Click the **Media Gateway** tab.

Step 4 Choose the **VoIP Parameters** option from the **Category** drop-down arrow.

Step 5 Complete the fields.

Note Table 6-71 describes fields in the Media Gateway tab, VoIP Parameters option.

Step 6 Click **Apply** to configure the VoIP parameters.

Table 6-71 Field Descriptions for the VISM-PR Media Gateway Tab, VoIP Parameters Option

Field Name	Description
BitMask for TOS (XGCP)	Provisions the bitmask used for the Type Of Service octet for cells carrying the control (XGCP) traffic.
BitMask for TOS (RTP)	Provisions the bitmask used for the Type Of Service octet for cells carrying VoIP bearer (RTP) traffic.
RTCP Report Interval	RTCP report interval (defined in RFC 1889)

Table 6-71 Field Descriptions for the VISM-PR Media Gateway Tab, VoIP Parameters Option (continued)

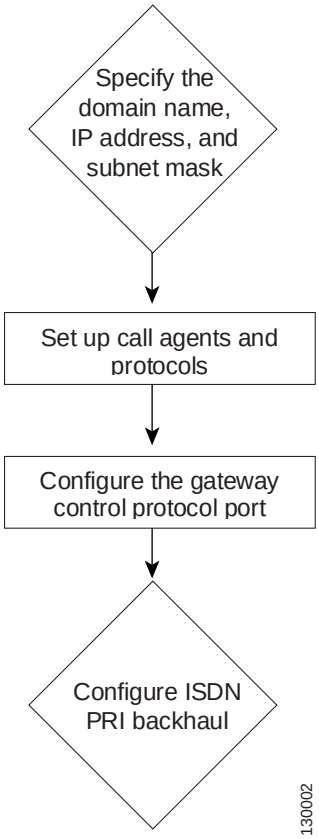
Field Name	Description
RTP Receive Timer	Defines whether the RTP packets receive timer on the VISM needs to be enabled or not.
DTMF Relay	Defines whether the Dual Tone, Multi-Frequency digits need to be transported to the other endpoint via Named Signal Event (NSE) packets.
CAS Transport	Defines whether the CAS (ABCD) bits need to be transported to the other endpoint via NSE packets.
Triple Redundancy Enable	Indicates whether triple redundancy is enabled or disabled.
NTE Negotiation Enable	Defines whether VISM has the capability to negotiate the list of events either NSE or NTE (Named Telephony Events) using rtp map and fmtpmap in the SDP.
Payload Type of RTP Packet	Sets the payload type of a RTP packet carrying SID which is sent to the other end when silence is detected.
Dual PVC OAM Cell Gap	Defines the inter cell gap for dual PVC OAM cells in milliseconds.
PVC Failure Threshold	Threshold for failure of a PVC. If the number of consecutive OAM cells sent for which no ack was received equals this number, then the connection is considered to be failed.
PVC Recovery Threshold	Threshold for recovery of a PVC. If the number of consecutive OAM cells sent for which no ack was received equals this number, then the connection is considered to be recovered from failure.
RTCP Interval Multiplier	Defines how many times the RTCP reports may fail before exception condition activity may be done.
LAPD Trunk PVC	Used for VoIP trunking applications, only if the signalling type is CCS. By default, the PRI-D channel information will be sent on the control channel. If the control network is totally separated from the bearer network, then you need to set this object to “bearer” to send LAPD trunk messages to the remote VISM.
VAD Timer	Hangover time for VAD in milliseconds. Once voice inactivity is detected, the gateway waits for this duration before activating silence suppression.

6.9.4.2 Configuring the ATM Network for VISM-PR

To configure the ATM network for VISM-PR cards by adding and configuring connections, please see Chapter 7, "Provisioning Connections."

6.9.4.3 Configuring the Call Agent Interface for VISM-PR

Figure 6-72 Process for Configuring the Call Agent Interface for VISM-PR



To configure the call agent interface, complete the following steps:

Step 1 Specify the domain name, IP address, and subnet mask—See 6.9.4.3.1 Specifying the Domain Name, IP Address and Subnet Mask for VISM-PR, page 6-147.

Step 2 Set up call agents and protocols—See 6.9.4.3.2 Setting Up Call Agents and Protocols for VISM-PR, page 6-149.

Step 3 Configure the gateway control protocol port—See 6.9.4.3.3 Configuring the Gateway Control Protocol Port for VISM-PR, page 6-158.

Step 4 Configure ISDN PRI backhaul—See 6.9.4.3.4 Configuring ISDN PRI Backhaul for VISM-PR, page 6-167.

6.9.4.3.1 Specifying the Domain Name, IP Address and Subnet Mask for VISM-PR

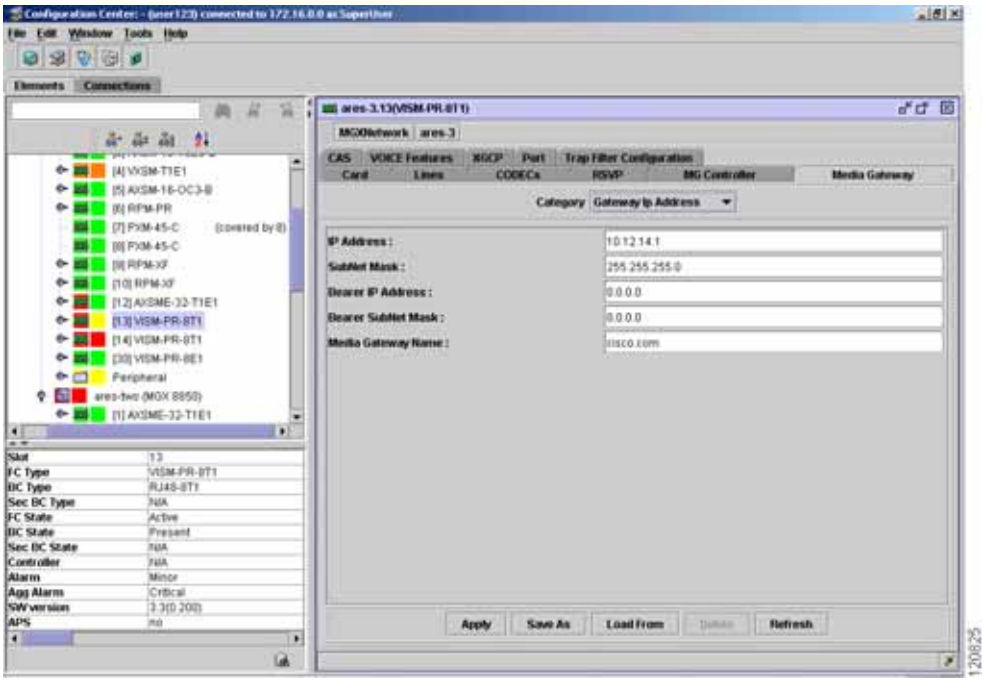
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Media Gateway** tab.

Step 4 Choose the **Gateway IP Address** option from the **Category** drop-down arrow.

Figure 6-73 Configuration Center—VISM-PR Media Gateway Tab, Gateway IP Address Category



Step 5 Complete the fields.

Note Table 6-72 describes fields in the VISM-PR Media Gateway tab, Gateway IP Address category.

Step 6 Click **Apply** to configure the parameters.

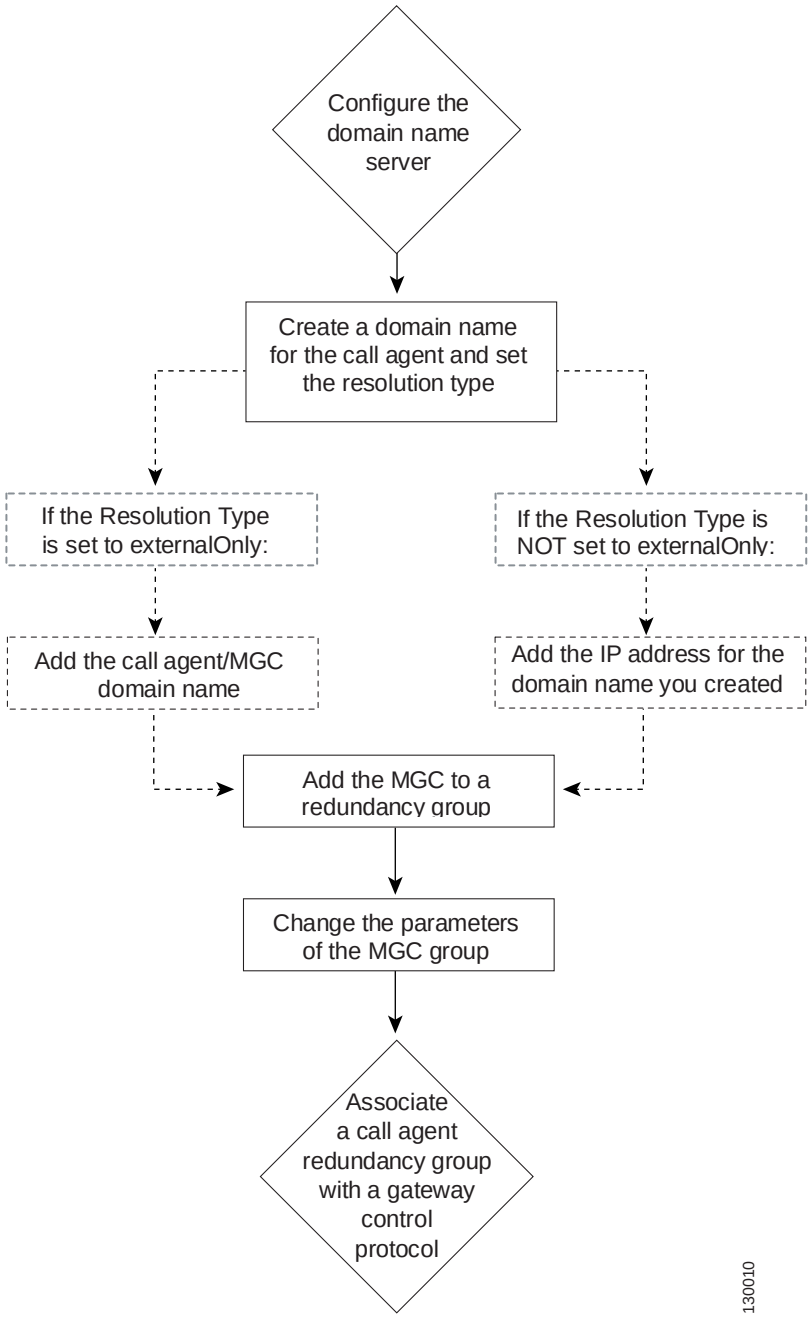
Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-72 Field Descriptions for the VISM-PR Media Gateway Tab, Gateway IP Address Category

Field Name	Description
IP Address	IP address of the VISM-PR card.
Subnet Mask	Subnet mask for the VISM-PR card.
Bearer IP Address	Bearer's IP address.
Bearer Subnet Mask	Bearer's subnet mask.
Media Gateway Name	Name of the media gateway as identified by media gateway controllers.

6.9.4.3.2 Setting Up Call Agents and Protocols for VISM-PR

Figure 6-74 Process for Setting Up Call Agents and Protocols for VISM-PR



To set up call agents and protocols for VISM-PR, complete the following steps:

Step 1 Configure the domain name server for the external domain name resolution:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

b. Under the **Elements** tab, within the node, double-click the VISM-PR card.

c. Click the **Media Gateway** tab. The **Gateway Capabilities** option appears by default in the **Category** drop-down arrow (see Figure 6-63).

d. Complete the **External DNS Name** field.

Note Table 6-65 describes fields in the VISM-PR Media Gateway tab, Gateway Capabilities category.

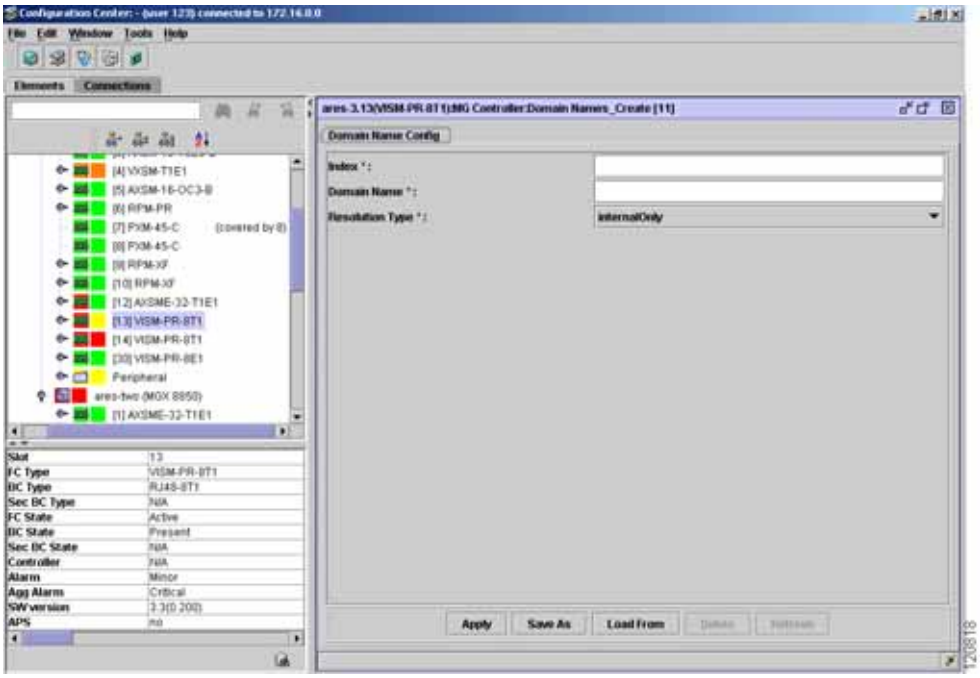
e. Click **Apply**.

Step 2 Create a domain name for the call agent:

a. Click the **MG Controller** tab. The **Domain Names** option appears by default in the **Category** drop-down arrow.

b. Click **Create**. The VISM-PR Create Domain Names window appears.

Figure 6-75 Configuration Center—VISM-PR Create Domain Names Window



c. Complete the fields. Note the value of the **Resolution Type** field.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, Domain Names category.

d. Click **Apply**.

Step 3 If you have *not* set the **Resolution Type** to **externalOnly** in Step 2, proceed to Step 4

or

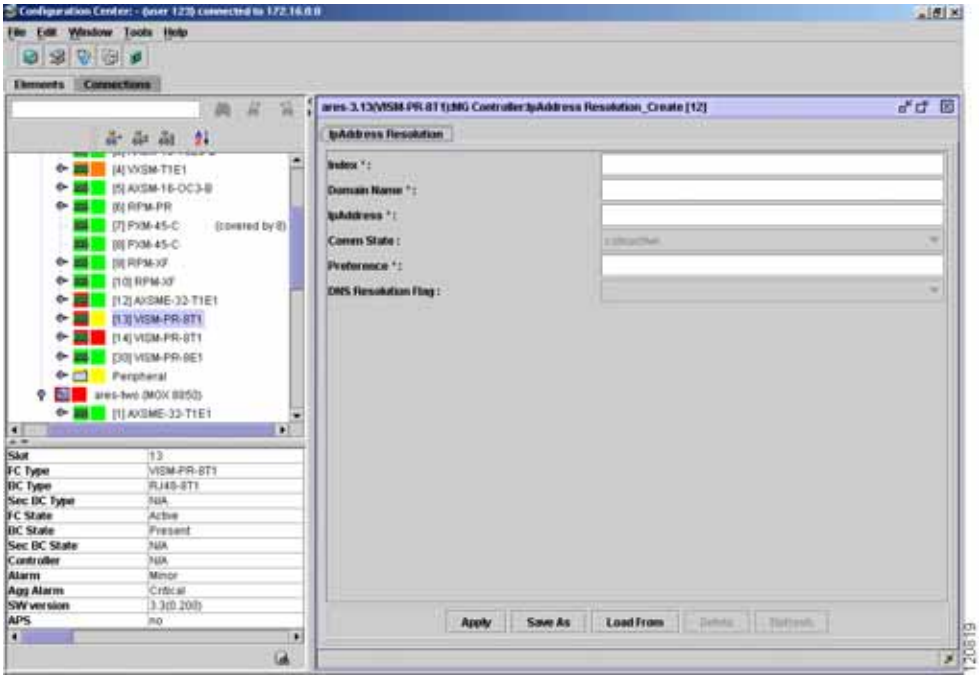
If you *have* set the **Resolution Type** to **externalOnly** in Step 2, proceed to Step 5.

Step 4 (Optional, see Step 3) Add the IP address for the **Domain Name** you created in Step 2:

a. Within the **MG Controller** tab, choose the **IP Address Resolution** option from the **Category** drop-down arrow.

b. Click **Create**. The VISM-PR Create IP Address Resolution window appears.

Figure 6-76 Configuration Center—VISM-PR Create IP Address Resolution Window



c. Complete the fields.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, IP Address Resolution category.

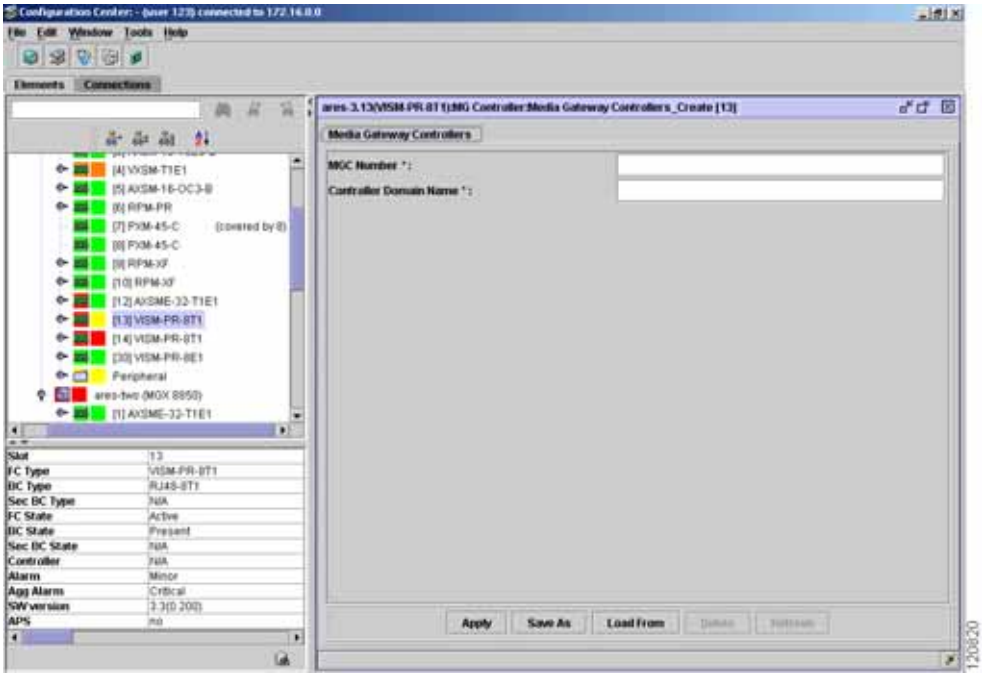
d. Click **Apply**.

Step 5 Add the call agent/MGC domain name:

a. Within the **MG Controller** tab, choose the **Media Gateway Controllers** option from the **Category** drop-down arrow.

b. Click **Create**. The VISM-PR Create Media Gateway Controllers window appears.

Figure 6-77 Configuration Center—VISM-PR Create Media Gateway Controllers Window



c. Complete the fields.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, Media Gateway Controllers category.

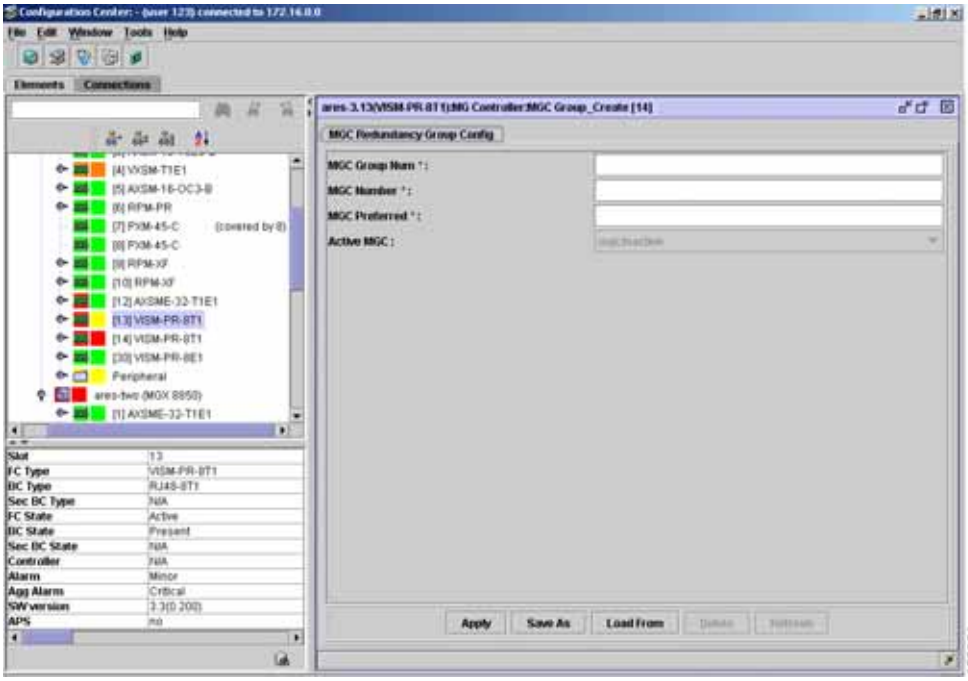
d. Click **Apply**.

Step 6 Add the MGC to a redundancy group:

a. Within the **MG Controller** tab, choose the **MGC Group** option from the **Category** drop-down arrow.

b. Click **Create**. The VISM-PR Create MGC Group window appears.

Figure 6-78 Configuration Center—VISM-PR Create MGC Group Window



c. Complete the fields.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, MGC Group category.

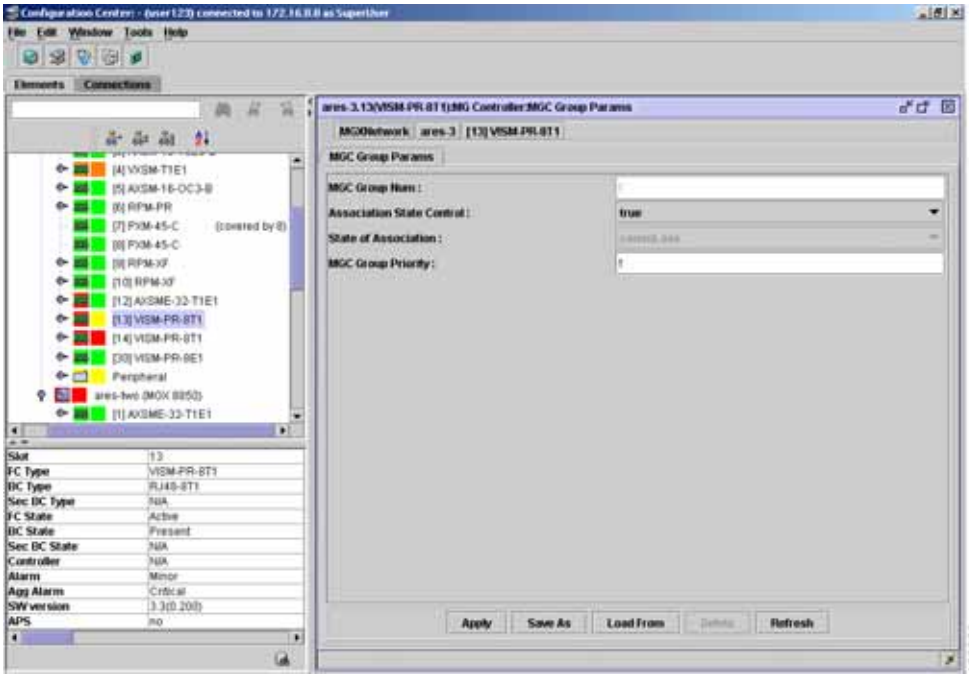
d. Click **Apply**.

Step 7 Change the parameters of the MGC group:

a. Within the **MG Controller** tab, choose the **MGC Group Params** option from the **Category** drop-down arrow.

b. Click on the MG group entry you want to modify, then click **Details**. The VISM-PR MGC Group Params window appears.

Figure 6-79 Configuration Center—VISM-PR MGC Group Params Window



c. Complete the fields.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, MGC Group Params category.

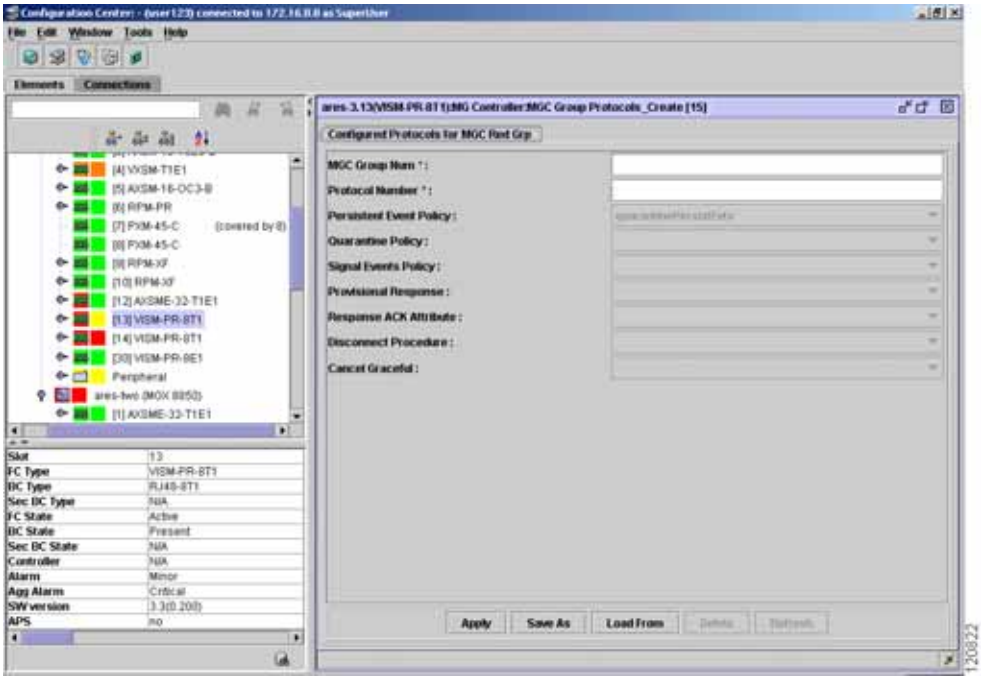
d. Click **Apply**.

Step 8 Associate a call agent redundancy group with a gateway control protocol:

a. Within the **MG Controller** tab, choose the **MGC Group Protocols** option from the **Category** drop-down arrow.

b. Click **Create**. The VISM-PR Create MGC Group Protocols window appears.

Figure 6-80 Configuration Center—VISM-PR Create MGC Group Protocols Window



c. Complete the fields.

Note Table 6-73 describes fields in the VISM-PR MG Controller tab, MGC Group Protocols category.

d. Click **Apply**.

Once you have created the MGC group protocol, Cisco MGM automatically adds an SRCP peer. For details on configuring SRCP peers, see Step 7 in section 6.9.4.3.3 Configuring the Gateway Control Protocol Port for VISM-PR, page 6-158.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-73 Field Descriptions for the VISM-PR MG Controller Tab

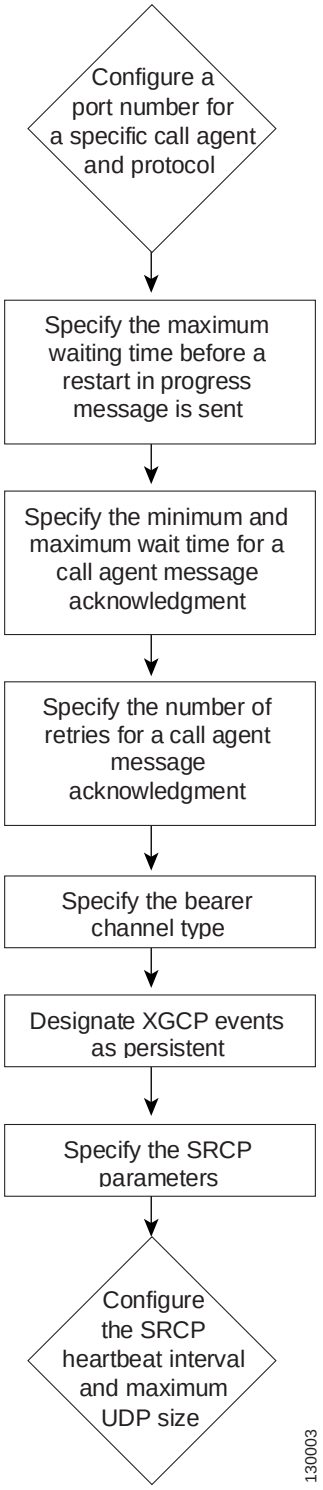
Category	Field Name	Description
Domain Names	Index	Index to this table.
	Domain Name	Domain name of MGCs, tftp server, external DNS server, or announcement server.
	Resolution Type	Type of DNS resolution to be applied for a particular domain name. Values include: • internalOnly—Specifies the gateway will not try to resolve the IP address for the domain name of the MGC by using the external Domain Name Service (DNS) name server. • externalOnly—Specifies the IP address for the domain name of the MGC is resolved externally by using the DNS name server. • internalFirst • externalFirst
IP Address Resolution	Index	Index to this table.
	Domain Name	Domain name of MGCs, tftp server, external DNS server, or announcement server.
	IP Address	IP address of the entity. To change the IP address, you need to remove an entry then add a new entry.
	Comm State	Indicates whether the address is currently applied for communications with the system of that name.
	Preference	Allows you to optionally configure primaries and secondaries. The lower the number, the higher the preference.
	DNS Resolution Flag	Type of DNS resolution.
Media Gateway Controllers	MGC Number	Index to this table.
	Controller Domain Name	Name of the MGC. Corresponds to a domain name under which the MGC could also be registered in a DNS.
MGC Group	MGC Group Num	MGC group number. A group can contain more than one MGC.
	MGC Number	MGC number.
	MGC Preferred	Allows you to optionally configure primaries and secondaries. The lower the number, the higher the preference.
	Active MGC	Denotes the MGC within a MGC redundancy group that is currently active or controlling the GW.

Table 6-73 Field Descriptions for the VISM-PR MG Controller Tab (continued)

Category	Field Name	Description
MGC Group Params	MGC Group Num	MGC group number. A group can contain more than one MGC.
	Association State Control	Enables or disables sending state change notifications to the call agent.
	State of Association	Represents the state of the communication between the MG and the MGC (call agent) groups.
	MGC Group Priority	Determines priority among the MGC redundancy groups within the GW.
MGC Group Protocols	MGC Group Num	MGC group number. A group can have more than one MGC.
	Protocol Number	Protocol number.
	Persistent Event Policy	Determines how the persistent events are notified.
	Quarantine Policy	Determines the quarantine policy when the call agent does not explicity specify one.
	Signal Events Policy	Enables you to provision the way signalled events from CA are handled by the gateway. This is configurable on a per MGC redundancy group, per protocol basis.
	Provisional Response	Enables or disables sending provisional responses to the CA when processing a request received from the CA.
	Response ACK Attribute	List of transaction IDs that are acknowledged by the call agent.
	Disconnect Procedure	Describes whether disconnected procedure has to be enabled or disabled per protocol per MGC group configured.
	Cancel Graceful	Describes whether notification of RSIP cancel graceful has to be enabled or disabled per protocol per MGC group configured.

6.9.4.3.3 Configuring the Gateway Control Protocol Port for VISM-PR

Figure 6-81 Process for Configuring the Gateway Control Protocol Port for VISM-PR



To configure the gateway control protocol port for VISM-PR, complete the following steps:

Step 1 Configure a port number for a particular call agent and protocol:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

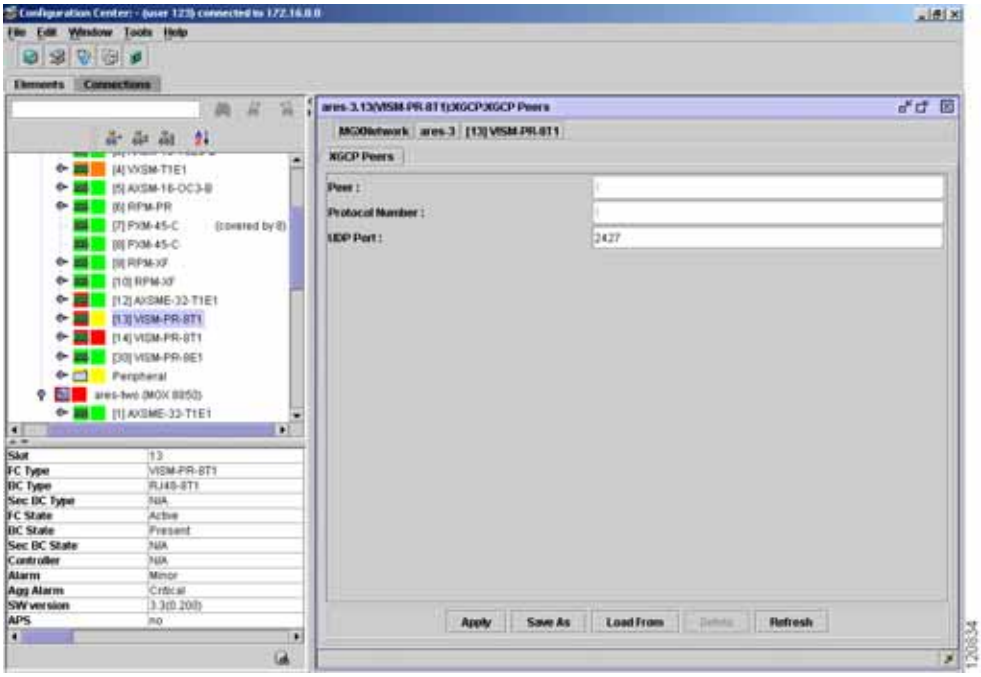
b. Under the **Elements** tab, within the node, double-click the VISM-PR card.

c. Click the **XGCP** tab.

d. Choose the **XGCP Peers** option from the **Category** drop-down arrow.

e. Click on a peer entry, then click **Details**. The XGCP Peers window appears.

Figure 6-82 Configuration Center—VISM-PR XGCP Peers Window



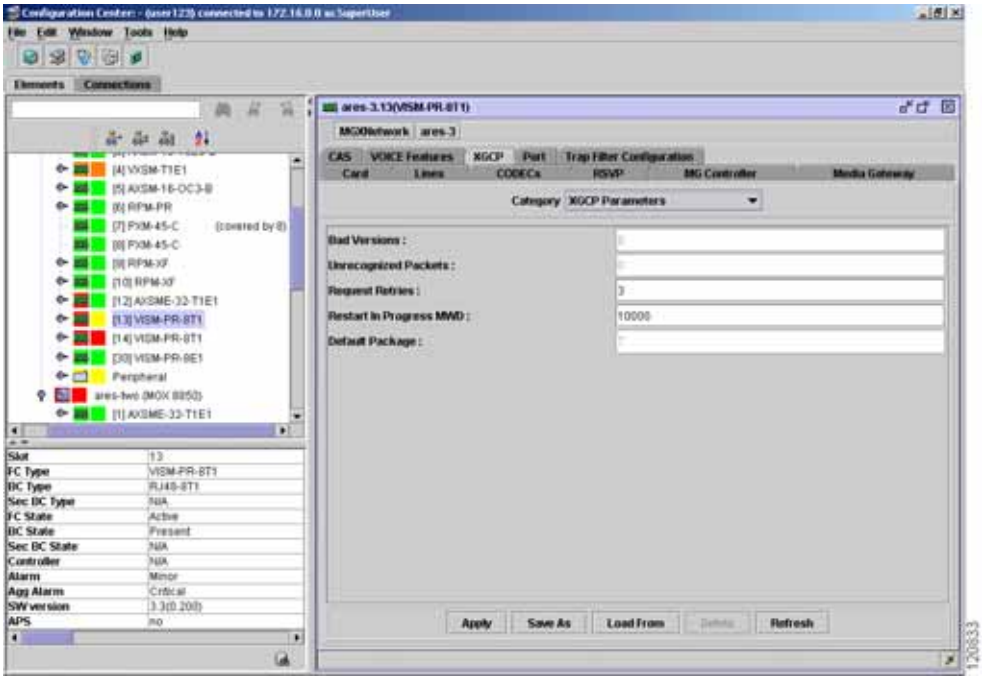
Note Table 6-74 describes fields in the VISM-PR XGCP tab, XGCP Peers option.

f. Click **Apply**.

Step 2 Specify the maximum waiting time before a Restart in Progress (RSIP) message is sent to the call agent:

a. Within the **XGCP** tab, choose the **XGCP Parameters** option from the **Category** drop-down arrow.

Figure 6-83 Configuration Center—VISM-PR XGCP Tab, XGCP Parameters Category



b. Configure the **Restart in Progress MWD** field.

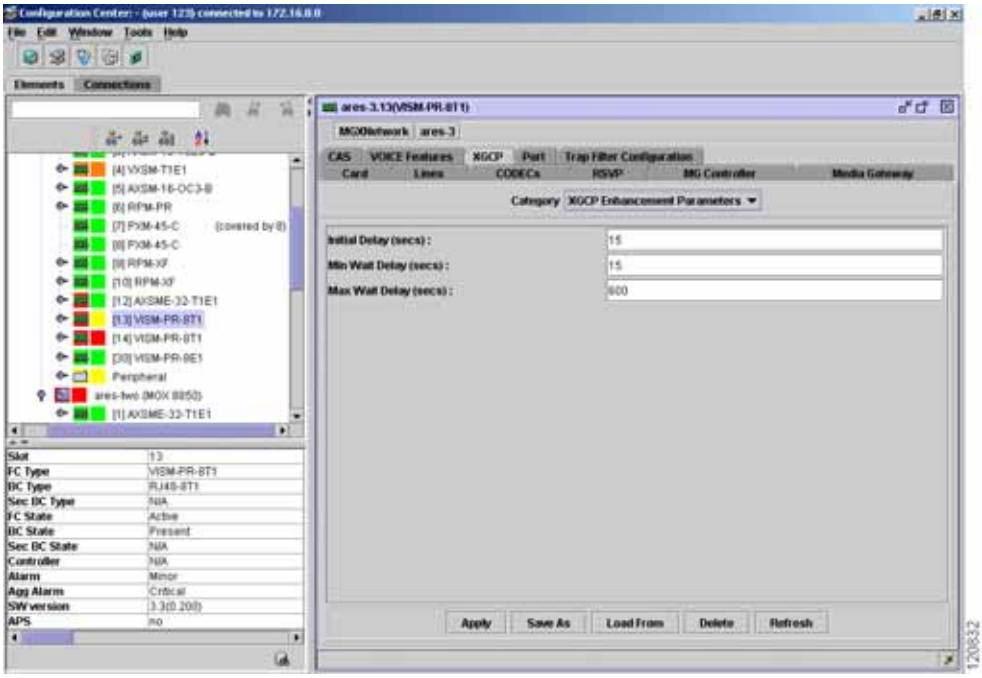
Note Table 6-74 describes fields in the VISM-PR XGCP tab, XGCP Parameters category.

c. Click **Apply**.

Step 3 Specify the VISM-PR minimum and maximum wait time for a call agent message acknowledgment:

a. Within the **XGCP** tab, choose the **XGCP Enhancement Parameters** option from the **Category** drop-down arrow.

Figure 6-84 Configuration Center—VISM-PR XGCP Tab, XGCP Enhancement Parameters Category



b. Configure the fields.

Note Table 6-74 describes fields in the VISM-PR XGCP tab. XGCP Enhancement Parameters category.

c. Click **Apply**.

Step 4 Specify the VISM-PR number of retries for a call agent message acknowledgment:

a. Within the **XGCP** tab, choose the **XGCP Parameters** option from the **Category** drop-down arrow (see Figure 6-83).

b. Configure the **Request Retries** field.

Note Table 6-74 describes fields in the VISM-PR XGCP tab, XGCP Parameters category.

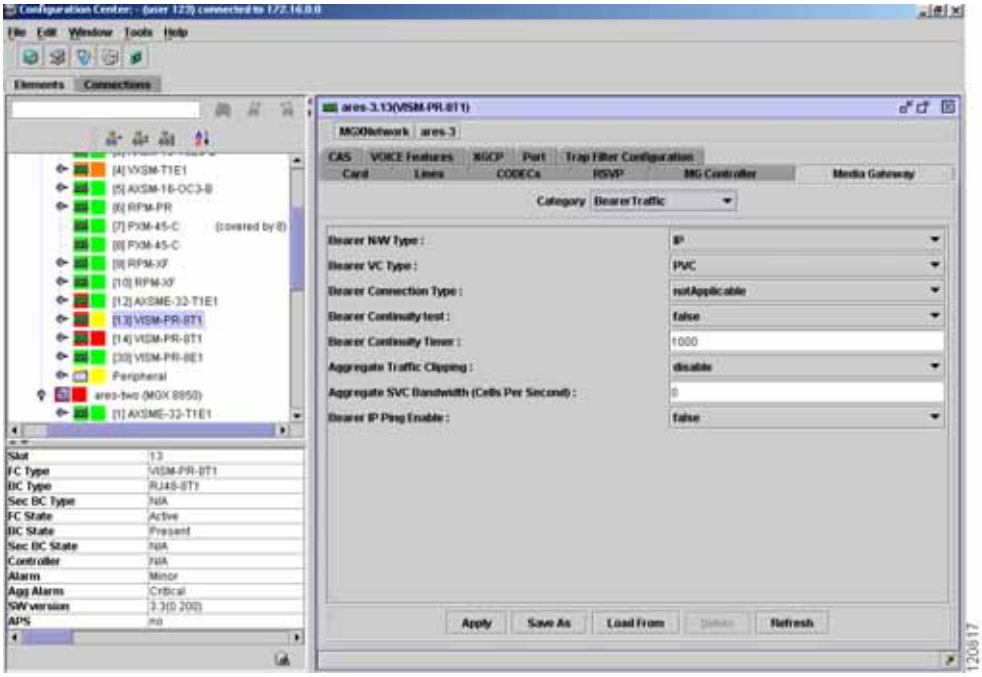
c. Click **Apply**.

Step 5 Specify the bearer channel type VISM-PR uses (if one is not specified by the call agent in protocol local connection options):

a. Click the **Media Gateway** tab.

b. Choose the **Bearer Traffic** option from the **Category** drop-down arrow.

Figure 6-85 Configuration Center—VISM-PR Media Gateway Tab, Bearer Traffic Category



c. Configure the **Bearer N/W Type**, **Bearer VC Type**, and **Bearer Connection Type** fields.

Note Table 6-75 describes fields in the VISM-PR Media Gateway tab, Bearer Traffic category.

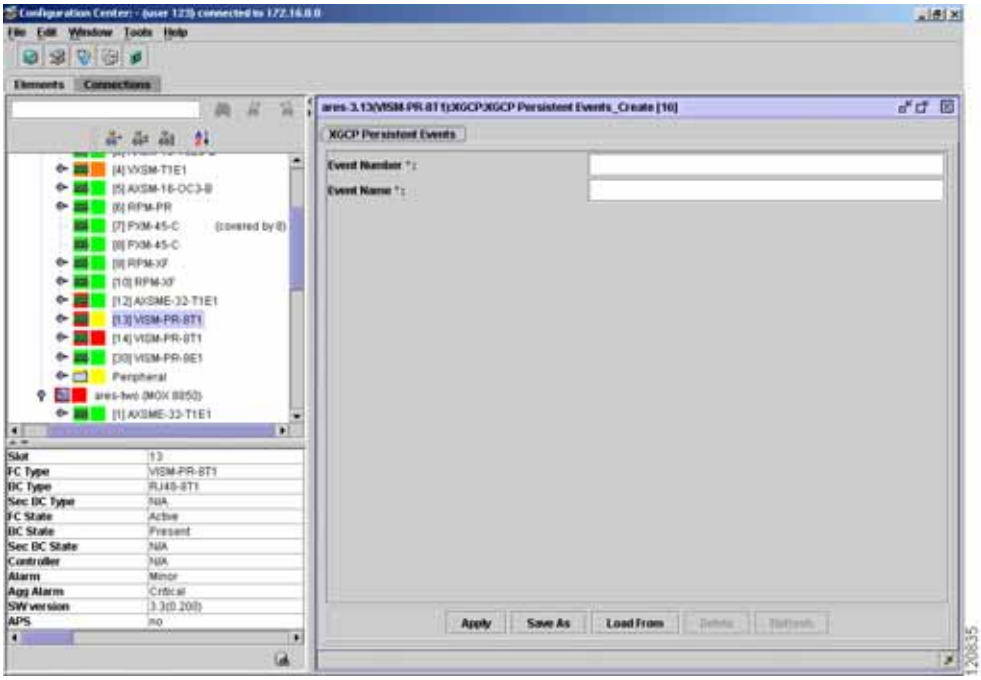
d. Click **Apply**.

Step 6 Designate XGCP events as persistent:

a. Within the **XGCP** tab, choose the **XGCP Persistent Events** option from the **Category** drop-down arrow.

b. Click **Create**. The Create XGCP Persistent Events window appears.

Figure 6-86 Configuration Center—VISM-PR Create XGCP Persistent Events Window



c. Configure the **Event Number** and **Event Name** fields.

Note Table 6-74 describes fields in the VISM-PR XGCP tab, XGCP Persistent Events category.

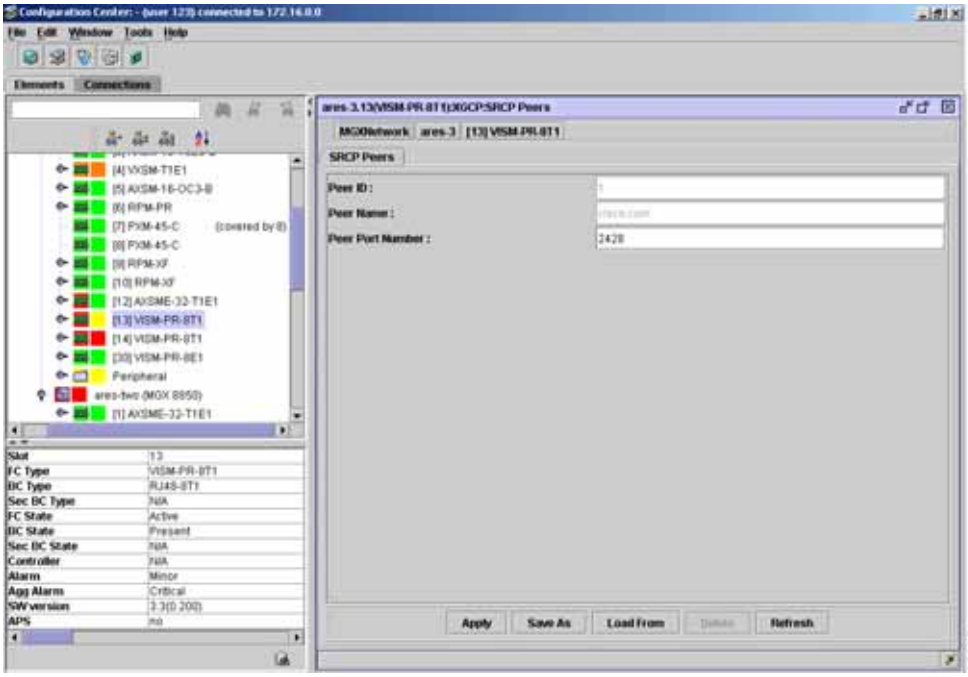
d. Click **Apply**.

Step 7 Specify the SRCP parameters for communication between VISM-PR and the call agent:

a. Within the **XGCP** tab, choose the **SRCP Peers** option from the **Category** drop-down arrow.

b. Click on a peer entry, then click **Details**. The SRCP Peers tab appears.

Figure 6-87 Configuration Center—VISM-PR SRCP Peers Tab



c. Complete the fields.

Note Table 6-74 describes fields in the VISM-PR XGCP tab, SRCP Peers category.

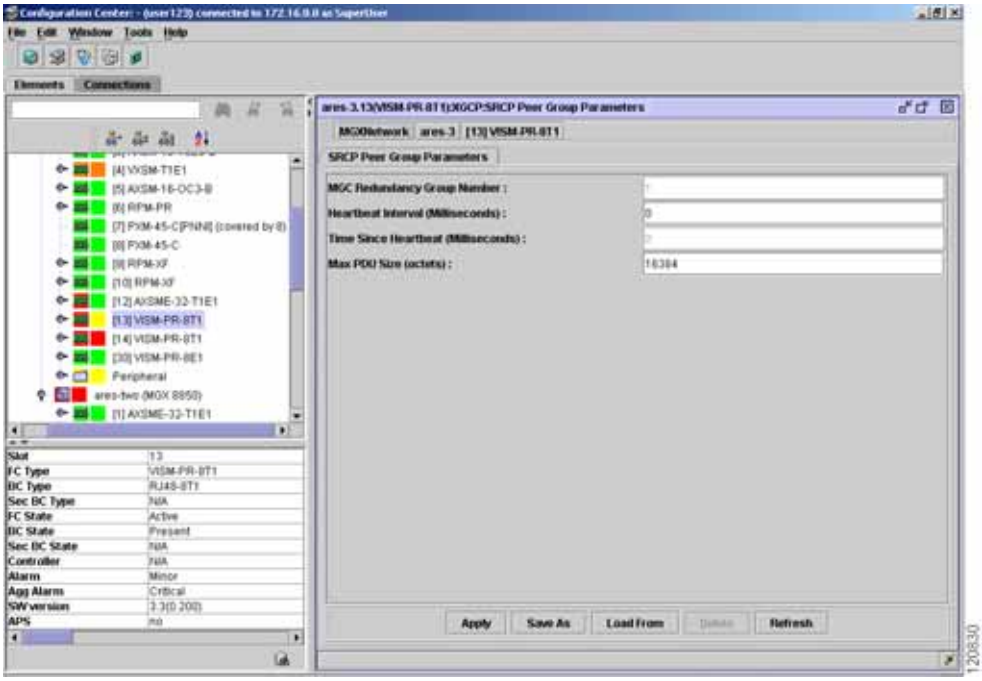
d. Click **Apply**.

Step 8 Configure the SRCP heartbeat interval and maximum UDP size for a specified call agent redundancy group:

a. Within the **XGCP** tab, choose the **SRCP Peer Group Parameters** option from the **Category** drop-down arrow.

b. Click on a peer entry, then click **Details**. The SRCP Peer Group Parameters tab appears.

Figure 6-88 Configuration Center—VISM-PR SRCP Peer Group Parameters Tab



c. Complete the fields.

Note Table 6-74 describes fields in the VISM-PR XGCP tab, SRCP Peer Group Parameters category.

d. Click **Apply**.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-74 Field Descriptions for the VISM-PR XGCP Tab

Category	Field Name	Description
XGCP Peers	Peer	Value of this object is the same as mgcNumber from MGMIB.
	Protocol Number	Value of this object is the same as mgcProtocolNumber from MGMIB.
	UDP Port	Configures the local UDP port on VISM-PR used by the SGCP and MGCP protocols to communicate with the call agent.

Table 6-74 Field Descriptions for the VISM-PR XGCP Tab (continued)

Category	Field Name	Description
XGCP Parameters	Bad Versions	Total number of incoming messages that were delivered to the protocol entity and were for an unsupported protocol version.
	Unrecognized Packets	
	Request Retries	Specifies the number of retries for a request that exceeds timeout.
	Restart in Progress MWD	Maximum waiting delay (MWD) timeout value is used for the MG to send the restart in progress to the MGC.
	Default Package	Contains the default package name for the MGCP/SGCP protocol. Should have the same value as xgcpCapabilityPackageName.
XGCP Enhancement Parameters	Initial Delay (secs)	Initial waiting delay (Tdinit) timeout value defined by this MIB object.
	Min Wait Delay (secs)	Minimum waiting delay (Tdmin) timeout value used by the MG to send the restart in progress with the restart method as RM:disconnected to the MGC if there is any local user activity is defined by this object.
	Max Wait Delay (secs)	Maximum waiting delay (Tdmax) timeout value used by the MG to send the restart in progress with the restart method as RM:disconnected to the MGC when the endpoint has become disconnected is defined by this object.
XGCP Persistent Events	Event Number	Event number.
	Event Name	Name of the event (for example, t/hd or t/hu).
SRCP Peers	Peer ID	Identifies the SRCP peer and serves as an index to the table. If MGMIB is supported, this is the same as the mgcNumber from the mgcTable.
	Peer Name	Denotes the name of the SRCP peer. If MGMIB is supported, this is the same as the mgcName from the mgcTable.
	Peer Port Number	Used to configure the UDP port used of the SRCP peer.
SRCP Peer Group Parameters	MGC Redundancy Group Number	MGC redundancy group number.
	Heartbeat Interval (milliseconds)	Configures the length of the heartbeat interval.
	Time Since Heartbeat (milliseconds)	Time since the last heartbeat was received.
	Max PDU Size (octets)	Configures the maximum UDP PDU size.

Table 6-75 Configuration Center—VISM-PR Media Gateway Tab, Bearer Traffic Category

Field Name	Description
Bearer N/W Type	Network type to transport bearer traffic. Values are IP or ATM.
Bearer VC Type	VC type to transport bearer traffic. Values are PVC or SVC.
Bearer Connection Type	Connection type used to transport bearer traffic. If the Bearer N/W Type is set to IP, then the value of this object must be set to not applicable.
Bearer Continuity Test	Defines whether the bearer continuity test for a connection will be performed or not at the time of call setup.
Bearer Continuity Timer	CO4 (bearer continuity) timer in milliseconds.
Aggregate Traffic Clipping	Enables or disables the aggregate traffic clipping policy applicable to all bearer traffic generated at the VISM-PR card.
Aggregate SVC Bandwidth (cells per second)	Used for AAL2 SVC aggregate SVC Connection Admission Control (CAC) and also for aggregate traffic clipping at VISM-PR card when Aggregate Traffic Clipping is enabled.

6.9.4.3.4 Configuring ISDN PRI Backhaul for VISM-PR

Step 1 Create a session set:

a. From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

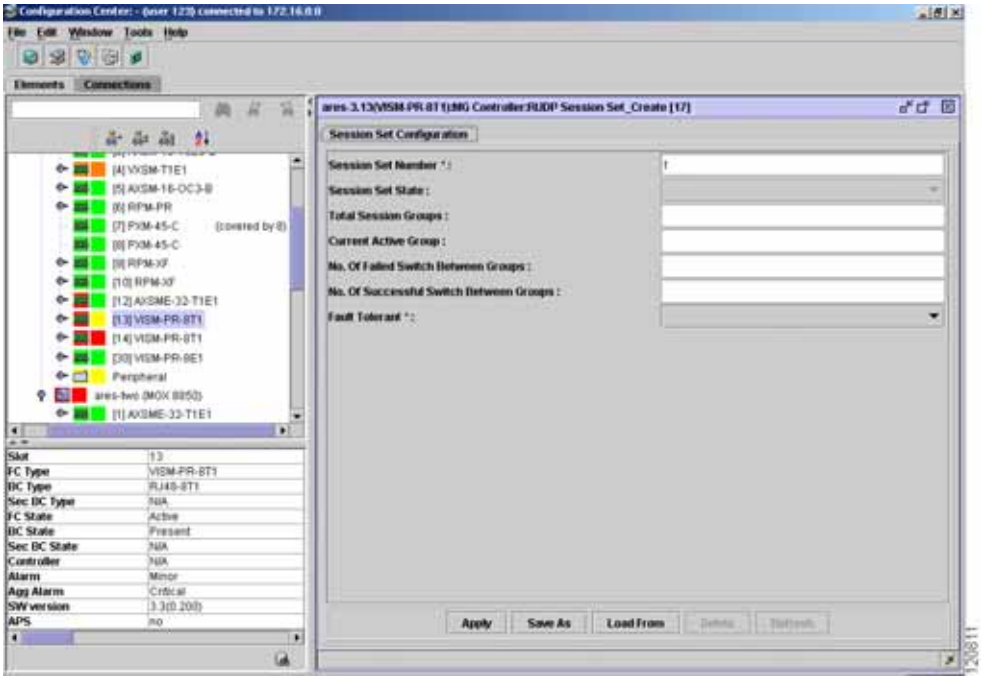
b. Under the **Elements** tab, within the node, double-click the VISM-PR card.

c. Click the **MG Controller** tab.

d. Choose the **RUDP Session Set** option from the **Category** drop-down arrow.

e. Click **Create**. The Create RUDP Session Set window appears.

Figure 6-89 Configuration Center—VISM-PR Create RUDP Session Set Window



f. Complete the fields.

Note Table 6-76 describes fields in the VISM-PR MG Controller tab, RUDP Session Set category.

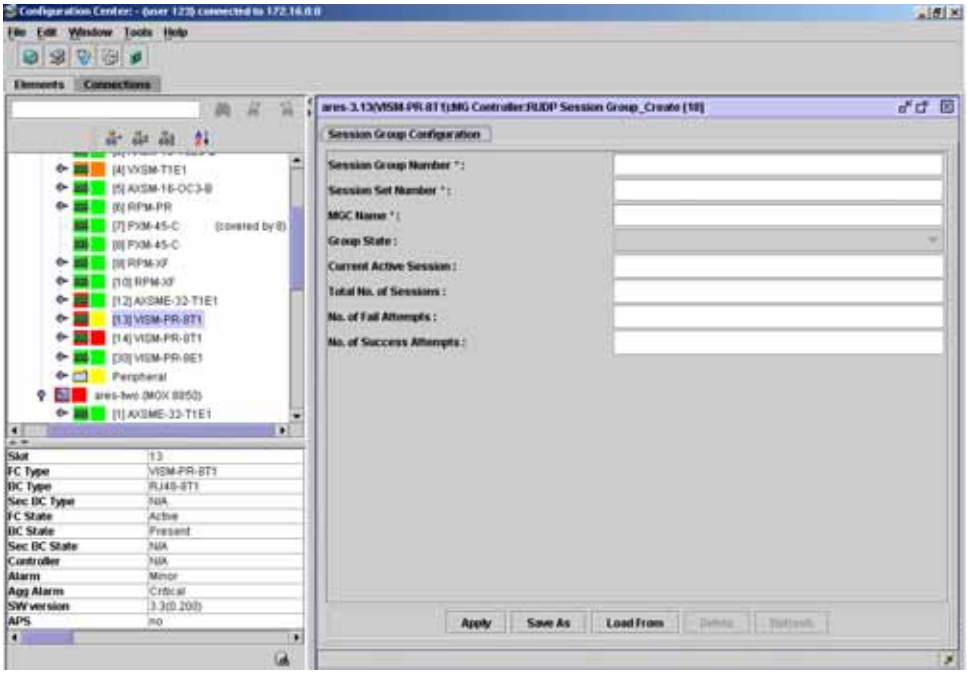
g. Click **Apply** to add a RUDP session set.

Step 2 Create a session group for a session set and a call agent:

a. Within the **MG Controller** tab, choose the **RUDP Session Group** option from the **Category** drop-down arrow.

b. Click **Create**. The Create RUDP Session Group window appears.

Figure 6-90 Configuration Center—VISM-PR Create RUDP Session Group Window



c. Complete the fields.

Note Table 6-76 describes fields in the VISM-PR MG Controller tab, RUDP Session Group category.

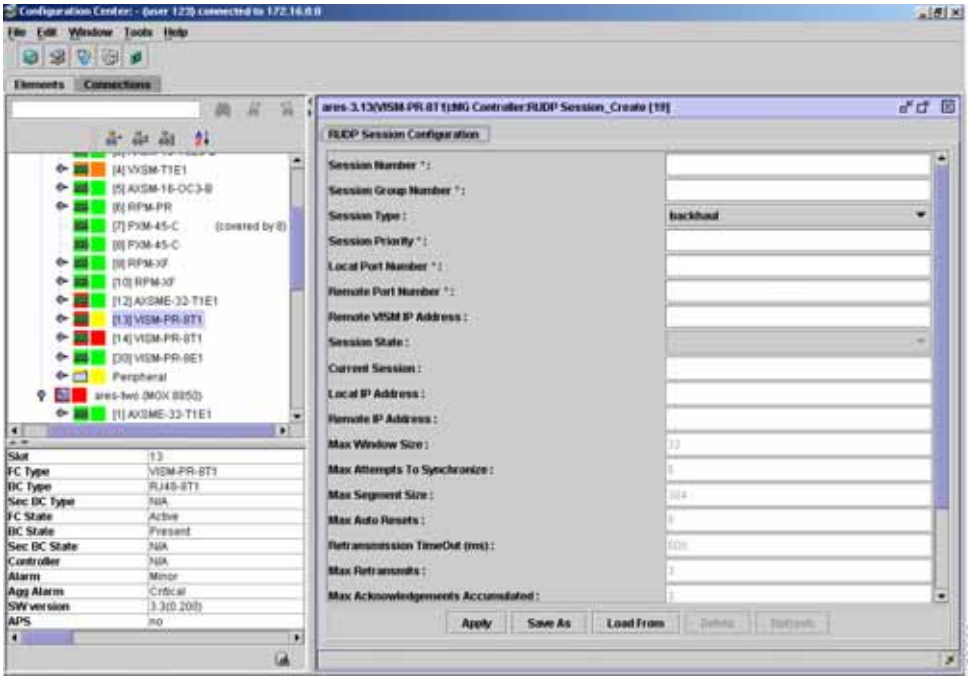
d. Click **Apply** to add a session group.

Step 3 Create an ISDN PRI backhaul RUDP session within a specified group:

a. Within the **MG Controller** tab, choose the **RUDP Session** option from the **Category** drop-down arrow.

b. Click **Create**. The Create RUDP Session window appears.

Figure 6-91 Configuration Center—VISM-PR Create RUDP Session Window



c. Complete the fields.

Note Table 6-76 describes fields in the VISM-PR MG Controller tab, RUDP Session category.

d. Click **Apply** to add a session group.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-76 Configuration Center—VISM-PR MG Controller Tab

Category	Field Name	Description
RUDP Session Set	Session Set Number	Logical index of this table. Currently only set 1 is used, and all the signaling channels are implicity mapped to set 1.
	Session Set State	Denotes the state the set is in.
	Total Session Groups	Keeps track of the number of session groups that has been added to a session set.
	Current Active Group	Current active group number.
	No. Of Failed Switch Between Groups	Number of failed attempts to switch between session groups in this set.
	No. Of Successful Switch Between Groups	Number of successful attempts to switch between session groups in this set.
	Fault Tolerant	Indicates whether the set configuration is fault tolerant or not.
RUDP Session Group	Session Group Number	Index for this table. One set can have up to two groups.
	Session Set Number	Session set number to which this session group belongs.
	MGC Name	Name of the media gateway controller, which corresponds to a domain name under which the MGC could also be registered in a DNS.
	Group State	State this session group is in.
	Current Active Session	Indicates the current session that is open to communication with the MGC. There is only one active session per group.
	Total No. of Sessions	Total number of session that have been added to this group.
	No. of Fail Attempts	Number of failed attempts to switch between sessions in this group.
	No. of Success Attempts	Number of successful attempts to switch between sessions in this group.

Table 6-76 Configuration Center—VISM-PR MG Controller Tab (continued)

Category	Field Name	Description
RUDP Session	Session Number	Index for this table. One group can have a maximum of four sessions.
	Session Group Number	A mandatory parameter if session type is backhaul, indicates the session group that this session belongs to.
	Session Type	Indicates if the session is configured for trunking or PRI backhaul.
	Session Priority	When a session fails, it indicates which session the session manager should try to bring active. A lower number means higher priority.
	Local Port Number	Port number of gateway (VISM-PR) for this session. The port number should be unique across other sessions and XGCP/SRCP.
	Remote Port Number	Port number of MGC for this session. The port number should be unique across other sessions and XGCP/SRCP.
	Remote VISM IP Address	IP address of the remote VISM-PR (a mandatory parameter if the session type is lapd trunking).
	Session State	State this session is in.
	Current Session	Indicates which session has received an active message from MGC.
	Local IP Address	IP address of gateway (VISM-PR).
	Remote IP Address	IP addressof the media gateway controller. It is resolved by using vismSessionGrpMgcNamein vismSessionGrpTable.
	Max Window Size	Max size of the receive window in segments, used for flow control.

Table 6-76 Configuration Center—VISM-PR MG Controller Tab (continued)

Category	Field Name	Description
RUDP Session (continued)	Max Attempts to Synchronize	Max number of attempts to synchronize with other side (MGC).
	Max Segment Size	Max number of octets that can be received by the peer sending the SYN segment.
	Max Auto Resets	Max number of consecutive auto reset that will be performed before a connection is reset.
	Retransmission TimeOut (ms)	(in milliseconds) Timeout value for retransmission of unacknowledged packets.
	Max Retransmits	Max number of times consecutive transmission will be attempted before the connection is considered broken.
	Max Acknowlegements Accumulated	Indicates the maximum number of acknowledgments that will be accumulated before sending an acknowledgment if another segment is not sent.
	Accumulated Acknowledgement TimeOut (ms)	(in milliseconds) Timeout value for sending an acknowledgment segment if another segment is not sent.
	Max Number Of Out Of Sequence Packets	Max number of out of sequence packets that will be accumulated before an EACK segment is sent. The EACK segment is used to acknowledge segments received out of sequence.
	Send Null Segment Timeout (ms)	Number of milliseconds of idle time before sending a null segment.
	Auto Reset Timeout (ms)	Number of milliseconds to wait for transfer state before an auto reset occurs.

6.9.4.4 Configuring TDM Signaling for CCS on VISM-PR

Configuring TDM signaling for CCS involves creating a LAPD channel. To create a LAPD channel, complete the following steps:

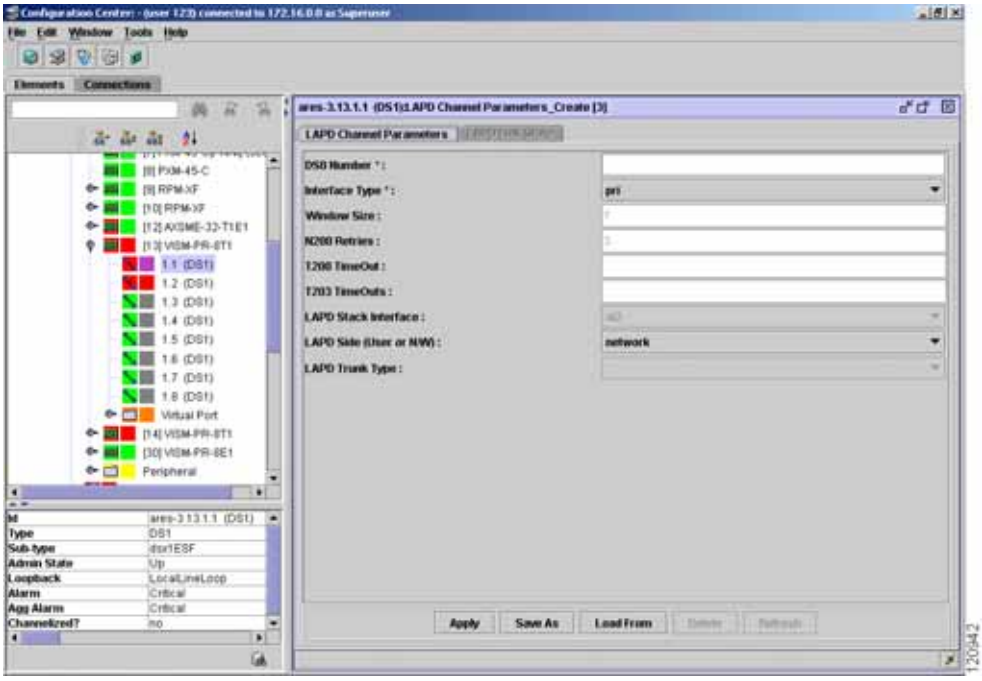
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click on the **LAPD Channel Parameters** tab.

Step 4 Click **Create**. The Create LAPD Channel Parameters window appears.

Figure 6-92 Configuration Center—VISM-PR Create LAPD Channel Parameters Window



Step 5 Configure the fields.

Note Table 6-77 describes fields in the VISM-PR Create LAPD Channel Parameters window.

Step 6 Click **Apply** to create a LAPD channel.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-77 Field Descriptions for the VISM-PR Create LAPD Channel Parameters Window

Field Name	Description
DS0 Number	DS0 number.
Interface Type	Type of LAPD interface.
Window Size	Maximum number of sequencially numbered l-frames that may be outstanding.
N200 Retries	Maximum number of re-transmissions of a frame.
T200 TimeOut	Maximum number of time (in milliseconds) to wait for acknowledgement for a transmit frame.
T203 Time Outs	Maximum time (in milliseconds) allowed without frames being exchanged.
LAPD Stack Interface	Specifies which type of interface the LAPD stack will be used with.

Table 6-77 Field Descriptions for the VISM-PR Create LAPD Channel Parameters Window (continued)

Field Name	Description
LAPD Side (User or N/W)	Specifies whether the LAPD stack is on the user or network side. This object can be set when the row is created, but cannot be modified for an existing row.
LAPD Trunk Type	Indicates if the line is configured for trunking or PRI-BH.

6.9.4.5 Adding and Configuring DS0 Endpoints on Lines

To add and configure DS0 endpoints on lines, complete the following steps:

Step 1 Add DS0 endpoints to lines—See 6.9.4.5.1 Adding DS0 Endpoints to Lines for VISM-PR, page 6-175.

Step 2 (Optional) View DS0 endpoints—See 6.9.4.5.2 Viewing DS0 Endpoints, page 6-177.

Step 3 Configure DS0 parameters—See 6.9.4.5.3 Configuring DS0 Parameters, page 6-177.

6.9.4.5.1 Adding DS0 Endpoints to Lines for VISM-PR

To add DS0 endpoints to lines for VISM-PR T1 or E1 lines:

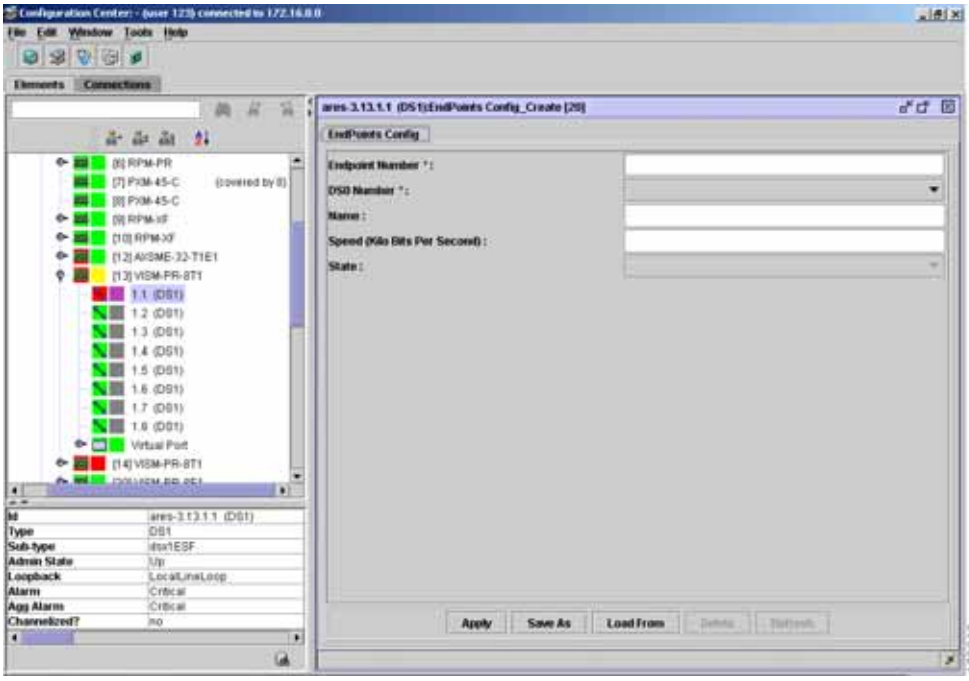
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **EndPoints Config** tab.

Step 4 Click **Create** to display the Create Endpoints Config window.

Figure 6-93 Configuration Center—VISM-PR Create Endpoints Config Window



Step 5 Complete the fields.

Note Table 6-78 describes fields in the VISM-PR Create Endpoints Config window.

Step 6 Click **Apply** to add the DS0 endpoint to the line.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-78 Field Descriptions for the VISM-PR Create Endpoints Config Window

Field Name	Description
Endpoint Number	Identifies endpoint as it is known by the NE. Index to this table. The range is from 1-248.
DS0 Number	Bitmap of DS0s used by the endpoint. Bit positions set to 1 represent DS0s used by the endpoint. The position corresponds to the DS0 number. The following are possible ranges: • 1-24 for T1 lines • 1-31 for non-CAS E1 lines • 1-15, 17-31 for CAS E1 lines
Name	Identifies endpoint as it is known by the MGC. If MG and MGC use a mutually agreed upon convention, this may be supplied by the agent, for example, it may be read-only.
Speed (kilo bits per second)	Indicates the endpoint's bandwidth, in Kbps. Typically, this will be 64 times the number of channels terminated by the endpoint.
State	Indicates the state of the endpoint.

6.9.4.5.2 Viewing DS0 Endpoints

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **DSX0** tab. A table appears listing the DS0 endpoints.

6.9.4.5.3 Configuring DS0 Parameters

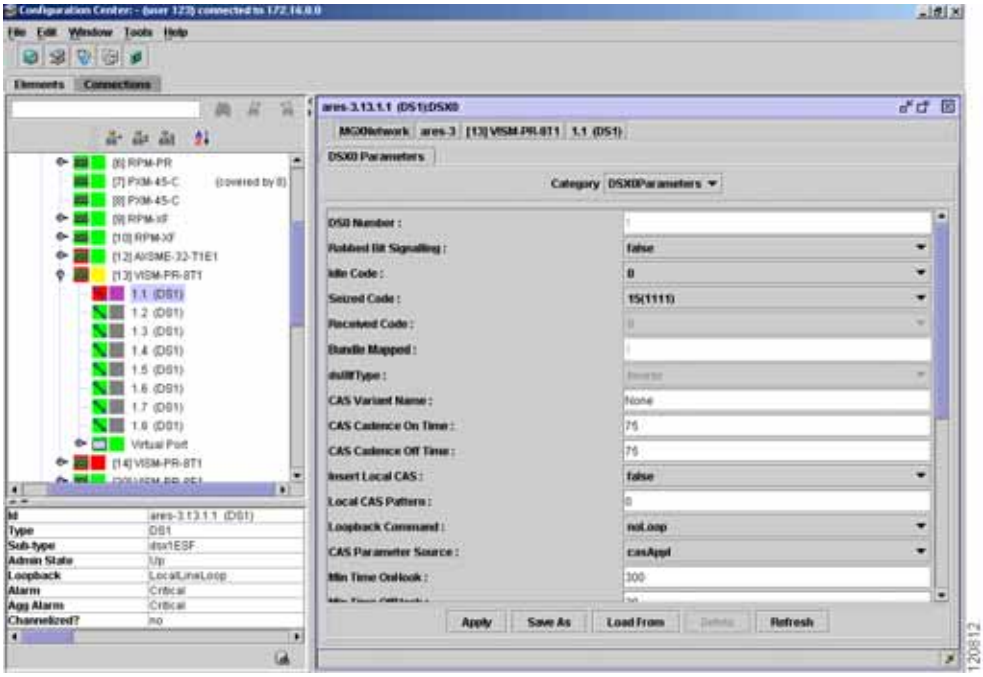
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the DS1 line under the VISM-PR card.

Step 3 Click the **DSX0** tab. A table appears listing the DS0 endpoints.

Step 4 Click on a DS0 entry and then click **Details**. The DSX0 Parameters window appears, with the DSX0 Parameters category selected by default.

Figure 6-94 Configuration Center—VISM-PR DSX0 Parameters Window, DSX0 Parameters Category



Step 5 Complete or modify the fields.

Note Table 6-79 describes fields in the VISM-PR DSX0 Parameters window, DSX0 Parameters category.

Step 6 Click **Apply** to configure the DSX0 parameters.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-79 Field Descriptions for the VISM-PR DSX0 Parameters Window, DSX0 Parameters Category

Field Name	Description
DS0 Number	DS0 number.
Robbed Bit Signalling	Indicates if robbed bit signalling is turned on or off for a given DS0. This only applies to DS0s on a DS1 link.
Idle Code	Contains the code transmitted in the ABCD bits when the DS0 is not connected and DS0TransmitCodesEnable is disabled. Possible values are 0-15.
Seized Code	Contains the code transmitted in the ABCD bits when the DS0 is connected and DS0TransmitCodesEnable is enabled. Possible values are 0-15.

Table 6-79 Field Descriptions for the VISM-PR DSX0 Parameters Window, DSX0 Parameters Category (continued)

Field Name	Description
Received Code	Contains the code being received in the ABCD bits.
Bundle Mapped	Indicates endpoint number as specified by mgEndpointNumber of endpoint table. If it is not associated with any endpoint, then it is set to -1.
ds0IfType	Indicates the interface type associated with the DS0.
CAS Variant Name	Indicates the index to the CAS variant table.
CAS Cadence On Time	Describes the duration during which the digit tone is generated.
CAS Cadence Off Time	Corresponds to the silence between the digit tones.
Insert Local CAS	Tells the framer whether or not to force the CAS bits to a value defined by ds0LocalCasPattern.
Local CAS Pattern	Contains the pattern that the CAS (ABCD) bits will have when ds0InsertLocalCas is enabled.
Loopback Command	Represents the loopback type at the DS0 level. The DS0 configuration overrides the line level configuration.
CAS Parameter Source	Indicates to VISM-PR whether to read the CAS related timer parameters from the casAppl file downloaded for that endpoint or to read from this mib.
Min Time On Hook	Minimum time in milliseconds for which the on hook pattern should be present in order for it to be recognized else the signal will be considered to be spurious and will be ignored.
Min Time Off Hook	Minimum time in milliseconds for which the off hook pattern should be present in order for it to be recognized else the signal will be considered to be spurious and will be ignored.
Min Time Off Hook With Wink	Minimum duration for which the off hook part of wink signal should persist.
Max Time Off Hook With Wink	Maximum duration for which the off hook part of wink signal should persist. If it exceeds this time limit, the signal will be considered spurious and will be ignored.
Min Time On Hook With Wink	Minimum duration for which the on hook part of wink signal should persist.
Glare Time	Programmable timer, used to resolve the glare condition.
Guard Time	Duration between the end of one call and the start of the next call.
Delay for Immed Start Protocol	Indicates the time that VISM-PR should wait before outpulsing digits to the PBX after sending an off hook event. This applies only to immediate start protocol.
ds0SignalingType	Type of signaling on the line to which this DS0 belongs.
CAS Incoming MGCP Package	Controls (in conjunction with the card level persistentXgcpEventsTable) how persistent CAS events (like seize, disconnect, etc.) related to an incoming call observed on this DS0 are notified to the MGC.

Table 6-79 Field Descriptions for the VISM-PR DSX0 Parameters Window, DSX0 Parameters Category (continued)

Field Name	Description
CAS Outgoing MGCP Package	Controls (in conjunction with the card level persistentXgcpEventsTable) how persistent CAS events (like answer, disconnect, etc.) related to an outgoing call observed on this DS0 are notified to the MGC.
Music Threshold	Music on hold threshold in dBm.
Sid Package	Specifies whether the Silence Indication Detection packet should be generated when silence suppression is in active mode.
DSP Channel Level RAS	Status of DSP channel level RAS on the VISM-PR. When it is enabled, VISM-PR will configure the DSP through a HOST-DSP message on the individual channel.
Companding Law	Indicates whether input from or output to the TDM side of DS0 is u-law or a-law stream. Setting of this object does not take effect unless the corresponding DSP channel is closed and re-opened.

6.9.4.6 Configuring TDM Signaling for CAS on VISM-PR

To configure time-division multiplexing signaling for CAS, complete the following steps:

Step 1 Add a CAS variant to the VISM-PR card—See 6.9.4.6.1 Adding a CAS Variant to a VISM-PR Card, page 6-180.

Step 2 Configure the CAS variant and timing parameters—See 6.9.4.6.2 Configuring the CAS Variant and Timing Parameters, page 6-182.

Step 3 Associate an endpoint with the CAS variant—See 6.9.4.6.3 Associating an Endpoint With a CAS Variant, page 6-183.

6.9.4.6.1 Adding a CAS Variant to a VISM-PR Card

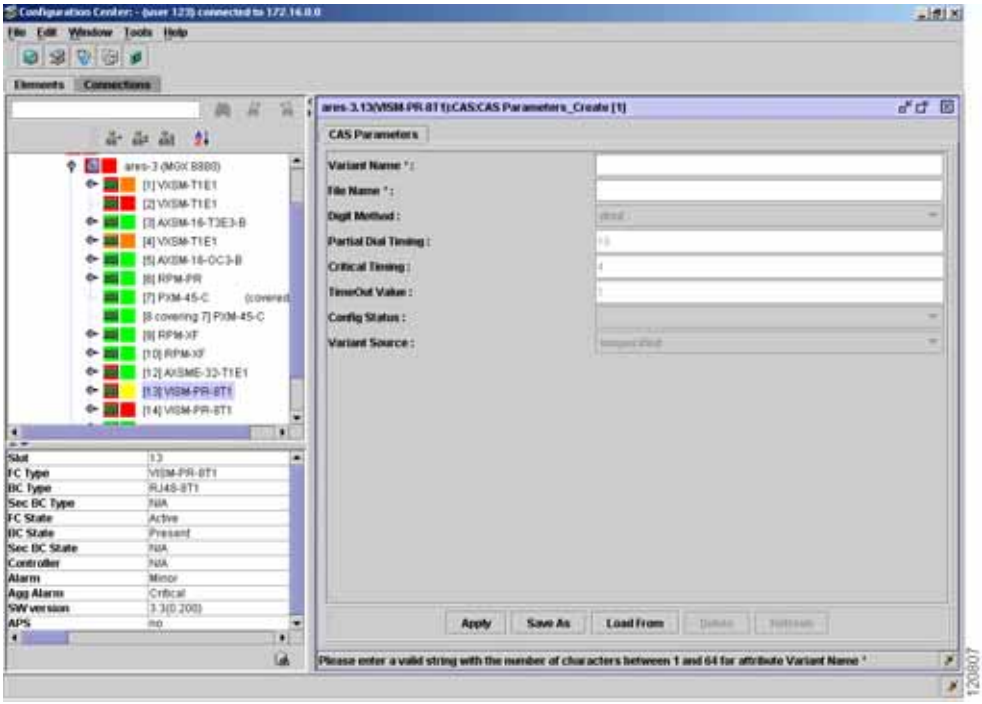
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **CAS** tab. The **CAS Parameters** category is selected by default.

Step 4 Click **Create**. The Create CAS Parameters window appears.

Figure 6-95 Configuration Center—VISM-PR Create CAS Parameters Window



Step 5 Complete the fields.

Note Table 6-80 describes fields in the VISM-PR Create CAS Parameters window.

Step 6 Click **Apply** to add the CAS variant to the card.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-80 Field Descriptions for the VISM-PR Create CAS Parameters Window

Field Name	Description
Variant Name	String identifier for the CAS variant. Used as index to the table. Valid ranges are 1-64.
File Name	Name of the file which contains the signal definition and the Finite State Machine definition for the CAS variant.
Digit Method	Default digit method used for digit collection.
Partial Dial Timing	Partial dial timing in seconds, used along with a digit map as the inter-digit timer.
Critical Timing	Critical timing in seconds.
Time Out Value	Interdigit timeout value in seconds for MF digits.

Table 6-80 Field Descriptions for the VISM-PR Create CAS Parameters Window (continued)

Field Name	Description
Config Status	Configuration status of the CAS variant.
Variant Source	Specifies where the file defining this CAS variant resides.

6.9.4.6.2 Configuring the CAS Variant and Timing Parameters

Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

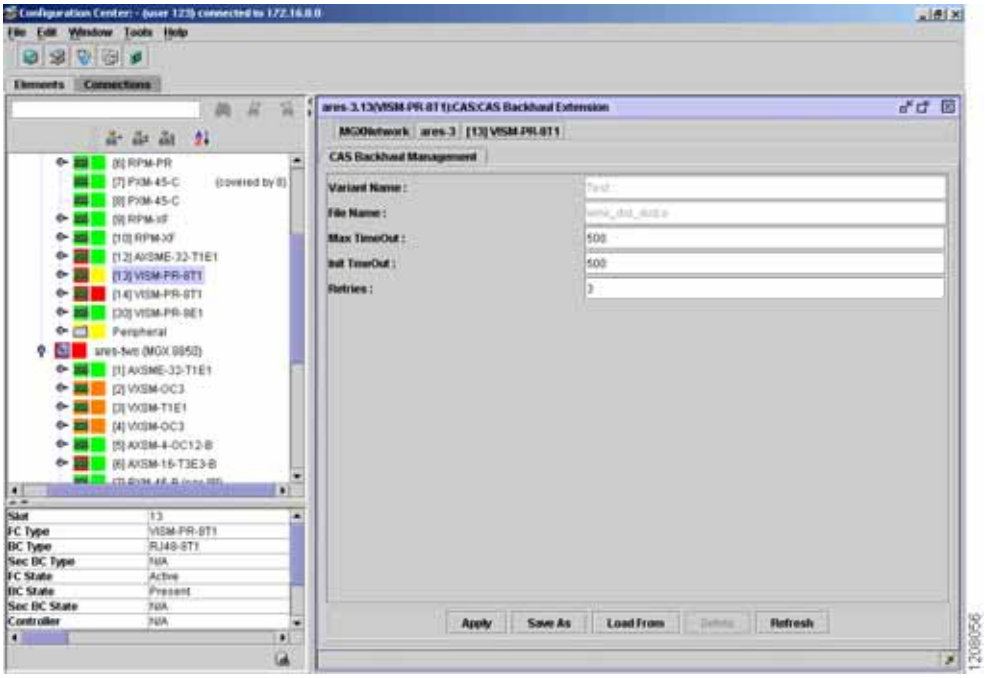
Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **CAS** tab. Choose the **CAS Backhaul Extension** option from the **Category** drop-down arrow.

Step 4 Within the variant table, click on the variant you want to configure, then click **Details**.

Step 5 Click **Create**. The CAS Backhaul Management tab appears.

Figure 6-96 Configuration Center—VISM-PR CAS Backhaul Management Tab



Step 6 Complete the fields.

Note Table 6-81 describes fields in the VISM-PR CAS Backhaul Management tab.

Step 7 Click **Apply** to configure the CAS variant and timing parameters.

Note For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-81 Field Descriptions for the VISM-PR CAS Backhaul Management Tab

Field Name	Description
Variant Name	String identifier for the CAS variant, used as an index to the table.
File Name	Name of the fiel that contains the signal definition and the Finite State Machine definition for the CAS variant.
Max TimeOut	Maximum timeout value in milliseconds, used for re-transmitting unacknowledged XGCP messages at the call agent CAS/PBX interface.
Init TimeOut	Initial timeout value in milliseconds, used for re-transmitting unacknowledged XGCP messages at the call agent CAS/PBX interface.
Retries	Specifies the number of retries for a message that exceeds vismCasXgcpMaxReXmitTime or vismCasXgcpInitialReXmitTime.

6.9.4.6.3 Associating an Endpoint With a CAS Variant

For details, refer to section 6.9.4.5.3 Configuring DS0 Parameters, page 6-177.

6.9.4.7 Placing the VISM-PR Card In or Out of Service

Placing the VISM-PR card out of service informs the call agent to not send any call requests to the VISM-PR card.

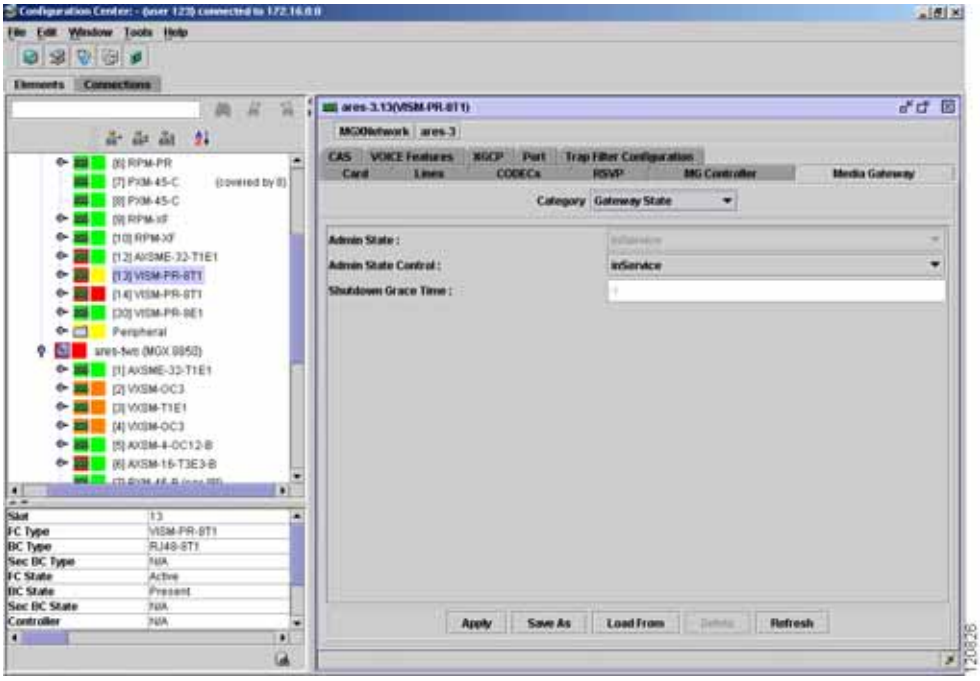
Step 1 From the Domain Explorer window, choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 Under the **Elements** tab, within the node, double-click the VISM-PR card.

Step 3 Click the **Media Gateway** tab.

Step 4 Choose the **Gateway State** option from the **Category** drop-down arrow.

Figure 6-97 Configuration Center—VISM-PR Media Gateway Tab, Gateway State Category



Step 5 Set the **Admin State Control** to the desired state.

Note Table 6-82 describes fields in the VISM-PR Media Gateway tab, Gateway State category.

For a description of all buttons within this tab, see section 6.2.3 Navigating Within Tables, page 6-9.

Table 6-82 Field Descriptions for the VISM-PR Media Gateway Tab, Gateway State Category

Field Name	Description
Admin State	Current admin state of the media gateway.
Admin State Control	Changes the service state of the media gateway. Options include: • inService • forcefulOutOfService • gracefulOutofService
Shutdown Grace Time	Indicates the time in seconds after which an MG will transition from shutting down to locked.

Provisioning Connections

This chapter details the tasks required to create new connections, and display, modify, and delete existing connections, and includes the following information:

- 7.1 What Is Connection Provisioning?
- 7.2 What Types of Connection Are Available?
- 7.3 Where Do I Find Information About Connections?
- 7.4 How Do I Create, Modify and Delete Voice Connections?
- 7.5 How Do I Configure Connection Templates?
- 7.6 How Can I Test the Connections?

7.1 What Is Connection Provisioning?

Cisco MGM supports device level provisioning of the Cisco MGX Media Gateway cards, lines, ports and connections, and the task of creating these connections is called connection provisioning.

Cisco MGM uses the Configuration Center to create new intra-chassis connections, and display, modify, and delete existing connections. You select the desired connection end-points and configure the connection type and class of service.

Connections in a switched voice applications are AAL-5 connections for bearer and control paths. A Media Gateway Controller or Call Agent is required for these switching applications.

By managing connections using the Configuration Center, you can create and maintain soft permanent virtual circuits (SPVCs).

7.2 What Types of Connection Are Available?

The type of connection available on each card is listed in Table 7-1.

Table 7-1 Supported Connection and Card Types

Connection Type	Card
ATM	AXSM (T3, E3)
	AXSM/B (T3, E3)
	AXSM-E (T1, E1)

Table 7-1 Supported Connection and Card Types (continued)

Connection Type	Card
RPM	RPM-PR
	RPM-XF
VISM	VISM-PR-8T1E1
	VXSM 48T1E1

7.2.1 What Are the Supported Connection Service Types?

Connections can be made between:

- VISM- RPM
- VISM- ATM

When adding a new connection from the Configuration Center application, the service type and protocol is SPVC.

For information about preparing a node for connection, see Chapter 4, "Building the Network".

7.3 Where Do I Find Information About Connections?

Configuration Center is used to create new connections, and to display, modify, and delete existing connections. In addition, the status for each connection is viewed from one endpoint to the other.

Note 6.2 How Do I Manage My Network with the Configuration Center? gives full details of launching Configuration Center, and describes the main window components.

These tasks are used to monitor connections with Connection Browser:

- 7.3.1 Finding Information in the Connection List Tab
- 7.3.2 Displaying All Existing Connections
- 7.3.3 Displaying Connections of the Same Type
- 7.3.4 Editing the Filter Settings

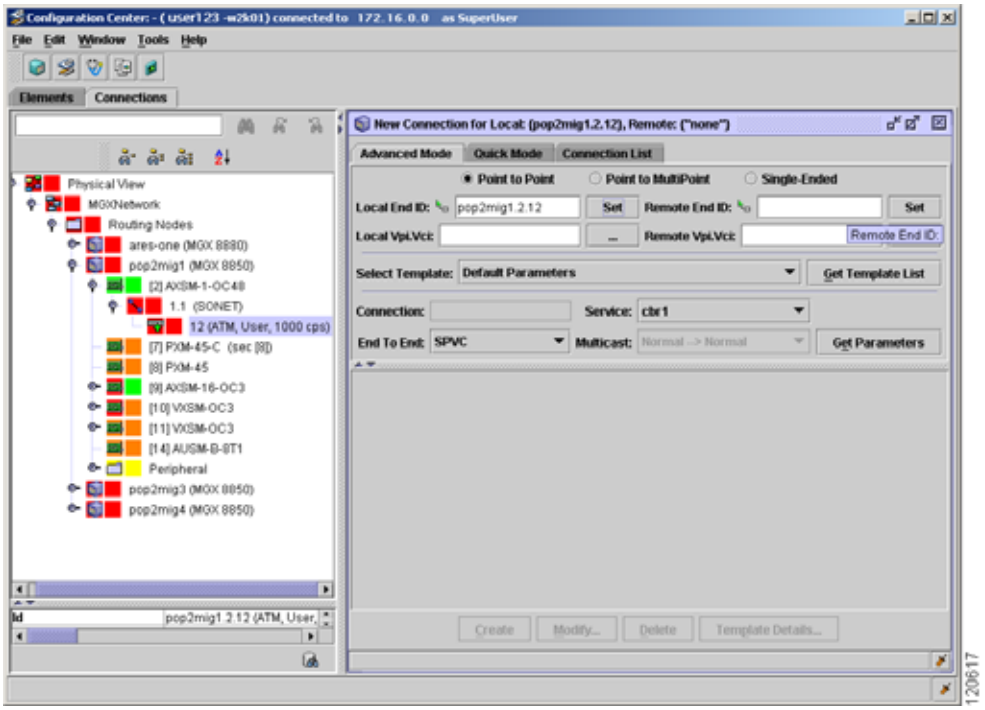
7.3.1 Finding Information in the Connection List Tab

Open the Configuration Center, choose **Configuration > MGX 8880/8850 MG > Configuration Center**. Click the Connections tab to display the Connections Hierarchy pane. See Figure 7-1. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details. Table 7-2 details the information in each tab.

Table 7-2 Configuration Center—New Connection Tabs

Access Tab	Task
Advanced Mode	Configures the following tasks for connections in Advanced Mode: • Creates and modifies connections. • Saves connection templates. • Changes and applies all the parameters listed in the Connection Category pane. • Displays and modifies local end parameters, remote end parameters, and connection parameters.
Quick Mode	Configures the following tasks for connections in Quick Mode: • Creates and modifies connections. • Retrieves the connection templates. • Adds the connection descriptor.
Connection List	Displays a list of all connections under an element (node, card, line, port.)

Figure 7-1 Configuration Center—Advanced ModeTab



7.3.2 Displaying All Existing Connections

To display all existing connections:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Move the objects, for example, node, card, line, or port from the Hierarchy pane on the Connection tab to the **Local End ID** field on the **Advanced Mode** tab or **Quick Mode** tab.

Note The **Local End ID** field must be completed in order to retrieve connection information.

Step 3 Click the **Connection List** tab to display the Connection List details.

Step 4 Enter the number of connections that you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****. By default, ***** is displayed.

Note Filters setting can also be applied before retrieving connections, see 7.3.4 Editing the Filter Settings.

Step 5 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have local or remote endpoints are displayed in the connection list.

7.3.3 Displaying Connections of the Same Type

To display connections of the same type, for example, a VISM-RPM connection for VXSM and VISM-PR cards:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** to display the Connection Browser window.

Step 3 Move the node along with the active port to the **Local End ID** or **Remote End ID** field.

Step 4 Click **More Filters** to display the Filter Settings window.

Step 5 Check **VISM-RPM** check box in the **Type** area.

Step 6 Check **SPVC** check box in the **Service Type** area.

Step 7 Click **OK** to apply the selected filter settings.

Step 8 Click **Get** to list all VISM-RPM connections for the SPVC service type.

7.3.4 Editing the Filter Settings

In the Configuration Center, the filtering scheme defines the types of connections displayed in the Connection Browser window. By default, all connections for the selected device are displayed.

To edit the filter settings:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Move the objects, for example, node, card, line, or port from the Hierarchy pane on the Connection tab to the **Local End ID** or **Remote End ID** field.

Note The **Local End ID** field must be completed in order to retrieve connection information.

Step 3 Click the **Connection List** tab to display the Connection List details.

Step 4 Click **More Filters** to display the Filter Settings window. See Figure 7-2.

Step 5 Check or uncheck the check boxes to configure the settings for a specific filter category.

Note By default, all the filter settings are checked.

Step 6 To retrieve connections that have the same connection descriptor, enter the description in the **Connection Descriptor** field.

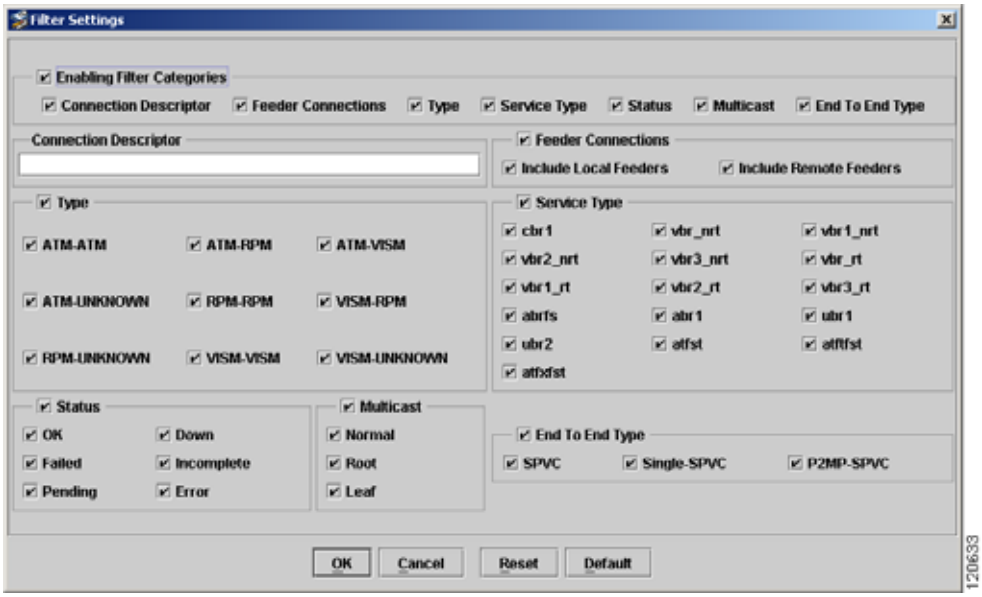
Table 7-3 defines the areas for the filter settings.

Table 7-3 Configuration Center—Filter Setting Definitions

Name	Definition
Enabling Filter Categories	Enables or disables the filters based on one of the five categories.
Connection Descriptor	Enables filtering on the Connection Descriptor text string.
Feeder Connections	Defines whether local and feeder connections are displayed in addition to the connections that terminate at the selected node. Also, remote feeders can filter down to the port level for the remote endpoint.
Type	Defines one or more of the eighteen basic connection types.
Service Type	Defines the connection service types: • VISM - RPM—vbr3-nrt, rt-vbr3(RPM-XF only), ubr1 • VXSM - RPM—vbr3-nrt, rt-vbr3(RPM-XF only), ubr1 • VISM - ATM—cbr1, vbr1-rt, vbr3-rt, vbr1-nrt, vbr3-nrt, ubr1 • VXSM - ATM—cbr1, vbr1-rt, vbr3-rt, vbr1-nrt, vbr3-nrt, ubr1
Status	Specifies the connection status, for example, OK, Down, Failed, Incomplete, Pending, or Error.
Multicast	This option is not used in Cisco MGM.
End to End Type	Defines the type of end to end statistics collection as SPVC,

Step 7 Click **OK** to apply the selected filter settings.

Figure 7-2 Filter Settings Window



7.4 How Do I Create, Modify and Delete Voice Connections?

These tasks describe how to create and manage voice connections for VXSM and VISM-PR cards:

- 7.4.1 Creating a VISM-RPM Connection in Connection Mode
- 7.4.2 Modifying a Connection in Connection Mode
- 7.4.3 Deleting Connections
- 7.4.4 Removing Incomplete Connections and Unused Connection Descriptors from the Network

7.4.1 Creating a VISM-RPM Connection in Connection Mode

You have two options to create a VISM-RPM connection for VXSM and VISM-PR cards:

- 7.4.1.1 Creating a VISM-RPM Connection in Advanced Mode
- 7.4.1.2 Creating a VISM-RPM Connection in Quick Mode

7.4.1.1 Creating a VISM-RPM Connection in Advanced Mode

To create a VISM-RPM connection in Advanced Mode for VXSM and VISM-PR cards:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Advanced Mode** tab.

Step 3 Choose one of the following options to move the node along with its active ports from the Hierarchy pane to the Advanced Mode Configuration window:

- Move the node along with the active ports to the **Local End ID** or **Remote End ID** field.
- Select the port for **Local End ID** and **Remote End ID** fields in the Hierarchy pane. In the New Connection window, click **Set** adjacent to the local-end ID and remote-end ID for the selected port.
- Enter the local-end ID and remote-end ID manually in the **Local End ID** and **Remote End ID** fields.

After endpoints are successfully committed, the VISM-RPM connection type is automatically entered in the **Connection** field

Step 4 Enter the Vpi.Vci/Channel values for the local endpoints. These values depend on the resource partition set up by the user for the VXSM card. See Chapter 7, "Provisioning Connections."

- Vpi is the slot number.
- Vci is the resource partition.

Note You can see the valid ranges for the Vpi.Vci values, click the button (**...**) next to the Local and Remote Vpi.Vci field. This opens the VpiVci Selector dialog box. Enter the correct values in the fields, and click **OK**.

Step 5 Enter the Vpi.Vci/Channel values for the remote endpoints for the RPM-XF or RPM-PR card.

Step 6 Choose the service type from the **Service** drop-down arrow.

Step 7 Click **Get Parameters** to display the default values for the local and remote endpoints to create a connection.

Step 8 Choose the following adaptation option from the **Adaptation Type** drop-down arrow:

- **aal-5**—Supports VXSM and VISM-PR cards a control connection.

Step 9 Choose one of the following channel options for the Logical Channel Number (LCN) from the **Channel Application** drop-down arrow:

- **bearer** (default)—Supports VXSM and VISM-PR cards. The bearer channel carries only voice payload traffic.
- **control**—Supports VXSM and VISM-PR cards. The control channel carries only control traffic.

Step 10 Click **Details** to display the Connection Details window for the VISM-RPM connection type.

Step 11 Ensure that the attributes for the local endpoints, remote endpoints, and connections are correct in the Connection Details window.

Step 12 Click **OK** to set the attributes in the Connection Details window.

Step 13 Optional: Enter the text in the **Connection Descriptor** field. For example, for a VISM to RPM connection, enter:

```
vism-rpm-dallas-washington
```

Step 14 Click **Create** to create a new VISM-RPM connection for the node in Advanced Mode.

7.4.1.2 Creating a VISM-RPM Connection in Quick Mode

Note You must have a predefined template set up to create connections in Quick Mode. See 7.5.1 Creating Connection Templates.

To create a VISM-RPM connection in Quick Mode for VXSM and VISM-PR cards:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Quick Mode** tab to display the Quick Mode Configuration window.

Step 3 Choose one of the following options to move the node along with its active ports from the Hierarchy pane to the Quick Mode Configuration window:

- Move the node along with the active ports to the **Local End ID** or **Remote End ID** field.
- Select the port for **Local End ID** and **Remote End ID** fields in the Hierarchy pane. In the New Connection window, click **Set** adjacent to the local-end ID and remote-end ID for the selected port.
- Enter the local-end ID and remote-end ID manually in the **Local End ID** and **Remote End ID** fields.

After endpoints are successfully committed, the VISM-RPM connection type is automatically entered in the **Connection** field

Step 4 Enter the Vpi.Vci/Channel values for the local endpoints.These values depend on the resource partition set up by the user for the VXSM card. See Chapter 7, “Provisioning Connections.”

- Vpi is the slot number.
- Vci is the resource partition.

Step 5 You can see the valid ranges for the Vpi.Vci values, click the button (**...**) next to the Local and Remote Vpi.Vci field. This opens the VpiVci Selector dialog box. Enter the correct values in the fields, and click **OK**.

Step 6 Enter the Vpi.Vci/Channel values for the remote endpoints for the RPM-XF or RPM-PR card.

Step 7 Click **Get Template List** to retrieve the templates for both local and remote endpoints from the Connection Template List window.

Step 8 Optional: Enter the text in the **Connection Descriptor** field. For example, for a VISM to RPM connection, enter:

```
vism-rpm-dallas-washington
```

Step 9 Click **Create** to create a new VISM-RPM connection for the Cisco MGX 8850 node in Quick Mode.

7.4.2 Modifying a Connection in Connection Mode

You have two options to modify a connection for VXSM and VISM-PR cards:

- 7.4.2.1 Modifying a Connection in Advanced Mode
- 7.4.2.2 Modifying a Connection in Quick Mode

7.4.2.1 Modifying a Connection in Advanced Mode

To modify a connection in Advanced Mode:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** tab to display the list of connections.

Step 3 Move the node along with the active port to the **Local End ID** field.

Step 4 Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all connections, enter *****. By default, ***** is displayed.

Step 5 Click **Get** to display all connections and the status of connections for the selected node.

Step 6 Select a VISM-RPM connection type from the list of connections. Note that connections with a status of incomplete or error cannot be selected.

Step 7 Click **Details**. The Connection Details window for the connection type opens.

Step 8 Change to the values you require or use a template for the local endpoints, remote endpoints. Ensure the connections are correct in the Connection Details window.

Step 9 Click **OK** to modify the attributes in the Connection Details window.

Step 10 Click **Modify** to modify the parameters.

7.4.2.2 Modifying a Connection in Quick Mode

To modify a connection in Quick Mode:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** tab to display the list of connections.

Step 3 Move the node along with the active port to the **Local End ID** or **Remote End ID** field.

Step 4 Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all connections, enter *****. By default, ***** is displayed.

Step 5 Click **Get** to display all connections and the status of connections for the selected node.

Step 6 Select a VISM-RPM connection type from the list of connections. Note that connections with a status of incomplete or error cannot be selected.

Step 7 Click **Details**. The Connection Details window for the connection type opens.

Step 8 Click the **Quick Mode** tab to display all the values for each parameter for the selected VISM-RPM connection type.

Step 9 Choose the template from the **Select Template** drop-down arrow.

Step 10 Click **Get Template List** to retrieve the templates for local and remote endpoints from the Connection Template List window.

Step 11 Click **Modify** to modify the parameters.

7.4.3 Deleting Connections

To delete a connection:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Move the objects, for example, node, card, line, or port from the Hierarchy pane on the Connection tab to the **Local End ID** or **Remote End ID** field.

Note The **Local End ID** field must be completed in order to retrieve connection information.

Step 3 Click the **Connection List** tab to display the Connection List details. Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****. By default, ***** is displayed.

Step 4 Click **Get**.

Step 5 Select one or more connections from the list of connections.

Step 6 Click **Delete** to delete the selected connections.

If a successful deletion is confirmed, the notation "d" appears next to the connection number in the display table.

7.4.4 Removing Incomplete Connections and Unused Connection Descriptors from the Network

You can remove incomplete connections, and unused connection descriptors from the network.

To remove incomplete connections from the network:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Move the objects, for example, node, card, line, or port from the Hierarchy pane on the Connection tab to the **Local End ID** field.

Note The **Local End ID** field must be completed in order to retrieve connection information.

Step 3 Click the **Connection List** tab to display the Connection List details.

Step 4 Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****. By default, ***** is displayed.

Step 5 Click **Get**.

Step 6 Select one or more connections from the list of connections.

Step 7 Click **Force Delete** to forcefully delete the connections from the network.

Step 8 Click **OK** to proceed with the force delete for the selected connections.

If successful, the following message appears:

```
Successfully Deleted the Connection(s).
```

Click **OK** to close the success window.

If some network segments failed to get deleted, you are prompted with the following error message:

```
Can't Delete the Connection(s):
Some segments may be on the network.
```

Click **OK** to acknowledge the forced delete error message.

Note You can delete the failed endpoints from the switch command line interface (CLI).

Unused connection descriptors are in the database but are not associated with any connection.

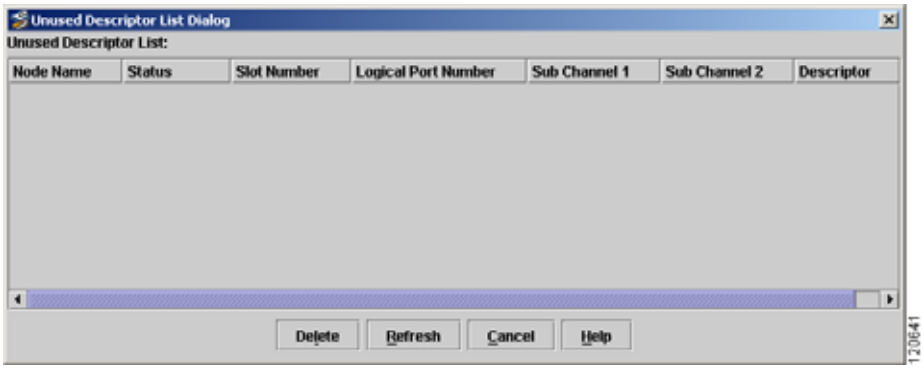
To remove the unused connection descriptors:

Step 1 In Configuration Center, choose **Edit > Show Unused Descriptors** to display the Unused Descriptor List window. (See Figure 7-3.)

Step 2 Select one or more connection descriptor entries.

Step 3 Click **Delete** to remove the unused connection descriptors from the database.

Figure 7-3 Unused Descriptor List Dialog



7.5 How Do I Configure Connection Templates?

These tasks are used to configure connection templates:

- 7.5.1 Creating Connection Templates
- 7.5.2 Displaying Connection Templates
- 7.5.3 Modifying Connection Templates
- 7.5.4 Deleting Connection Templates

You can configure templates for new or modified connection parameters. A template is a set of connection parameters for a specified connection. Cisco MGM provides default parameters that can be used to create a template. This template can be modified and saved with a new name. When using the template with the default parameters, the Unchanged button is not available.

7.5.1 Creating Connection Templates

To create connection templates:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Advanced Mode** tab to display the Advanced Mode Configuration window.

Step 3 Move the object, for example, node, card, line, or port from the Hierarchy pane to the **Local End ID** or **Remote End ID** field.

Step 4 Enter the value for the **Local Vpi.Vci/Channel** field.

Step 5 Enter the value for the **Remote Vpi.Vci/Channel** field.

Step 6 Click **Get Parameters** to display local-end, remote-end, and connection parameters.

Step 7 Click **Template Details** or choose **Edit > Connection Templates** to display the Template Configuration window. (See Figure 7-4.)

Note VISM and VXSM endpoints are shown as VISM endpoints. See Table 7-1 details the types of connections.

Step 8 Enter values in the following fields for the connection parameters:

- Local End Parameters
- Remote End Parameters
- Connection Parameters

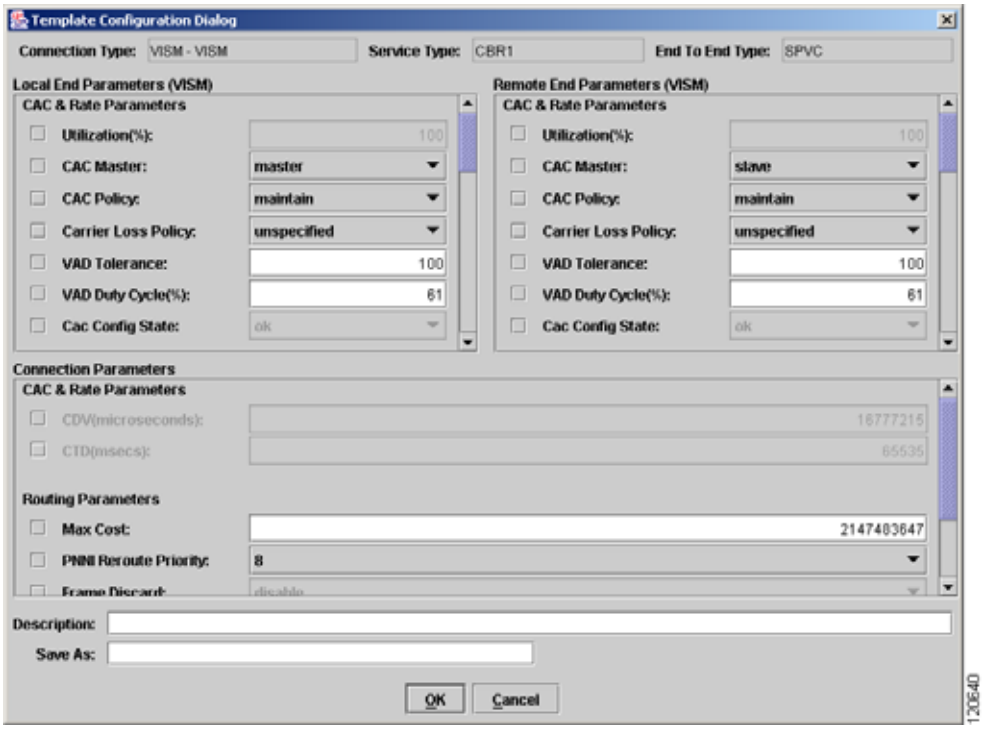
Note Tooltips provide descriptions of the fields within the Template Configuration window.

Step 9 Enter the description for the connection template in the **Description** field.

Step 10 Enter the new name for the connection template in the **Save As** field.

Step 11 Click **OK** to create the new connection template.

Figure 7-4 Template Configuration Dialog



7.5.2 Displaying Connection Templates

To display connection templates:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Choose one of the following options to display Connection Template List:

- Click **Get Templates** to display the Connection Template List.
- Choose **Edit > Connection Templates** to display the Connection Template List.

You can sort the following columns in ascending and descending order:

- Template ID
- Connection Type
- Service Type
- Owner ID

Step 3 Click **Refresh** to refresh the Template List window.

Step 4 Click **Cancel** to close the Template List window.

7.5.3 Modifying Connection Templates

To modify connection templates:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Choose one of the following options to display Connection Template List:

- Click **Get Templates**.
- Choose **Edit > Connection Templates**.

Step 3 Select the entry from the Connection Template List.

Step 4 Click **Details** to display the Template Configuration window for the selected template entry.

Note VISM and VXSM endpoints are shown as VISM endpoints. See Table 7-1 details the types of connections.

Step 5 Modify the following connection parameters:

- Local End Parameters
- Remote End Parameters
- Connection Parameters

Step 6 Enter the description for the connection template in the **Description** field.

Step 7 Rename the current connection template in the **Save As** field. Or save the template under the same name.

Step 8 Click **OK** to save the connection template with the changed configuration settings.

7.5.4 Deleting Connection Templates

To delete templates:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Advanced Mode** tab to display the Advanced Mode Configuration window.

Step 3 Move the object, for example, node, card, line, or port from the Hierarchy pane to the **Local End ID** or **Remote End ID** field.

Step 4 Choose one of the following options to display the Connection Template List:

- Click **Get Templates**.
- Choose **Edit > Connection Templates**.

Step 5 Select the entry from the Connection Template List.

Step 6 Click **Delete** to delete the connection template entry.

7.6 How Can I Test the Connections?

These tasks are described for miscellaneous test operations that are used to test connections:

- 7.6.1 Up a Connection
- 7.6.2 Down a Connection
- 7.6.3 Loopback a Connection

7.6.1 Up a Connection

You can up a connection. An SPVC connection is used as an example.

Note Before you can up a connection, ensure that the connection is disabled first.

To up an SPVC connection:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** tab.

Step 3 Click **More Filters** to display the Filter Settings window.

Step 4 Choose the filter settings from the Filter Settings window. For example, check both the **Status** check box and the **OK** check box if you want to retrieve only active connections.

Step 5 Click **OK** to apply the filter settings.

Step 6 Enter the number of connections that you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 7 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 8 Right-click the SPVC connection from the list of connections and choose **Diagnostic Center**.

Step 9 Click the **Miscellaneous Operations** tab to display the Miscellaneous Operation window.

Step 10 Click the **Up Connection** radio button.

Step 11 Click **Start Operation** to up the connection.

If successful, the Up Connection window appears.

7.6.2 Down a Connection

You can down a connection. An SPVC connection is used as an example.

Note Before you can down a connection, ensure that the connection is up first.

To down an SPVC connection:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** tab.

Step 3 Click **More Filters** to display the Filter Settings window.

Step 4 Choose the filter settings from the Filter Settings window. For example, check both the **Status** check box and the **OK** check box if you want to retrieve only active connections.

Step 5 Click **OK** to apply the filter settings.

Step 6 Enter the number of connections that you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 7 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 8 Click the **Miscellaneous Operations** tab to display the Miscellaneous Operation window.

Step 9 Click the **Down Connection** radio button.

Step 10 Click **Start Operation** to up the connection.

If successful, the Down Connection window appears.

7.6.3 Loopback a Connection

You can test a connection by creating a loopback on the connection. All types of connections in Cisco MGM support loopback. An SPVC connection is used as an example.

Note Before you can down a connection, ensure that the connection is up first.

To loopback an SPVC connection:

Step 1 In the Configuration Center, click the Connections tab to display the Connections Hierarchy pane. Select the NE, and double-click, or drag and drop the NE into the right-hand pane to display the New Connection details.

Step 2 Click the **Connection List** tab.

Step 3 Click **More Filters** to display the Filter Settings window.

Step 4 Choose the filter settings from the Filter Settings window. For example, check both the **Status** check box and the **OK** check box if you want to retrieve only active connections.

Step 5 Click **OK** to apply the filter settings.

Step 6 Enter the number of connections that you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 7 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 8 Click the **Miscellaneous Operations** tab to display the Miscellaneous Operation window.

Step 9 Click the **Loopback Connection** radio button.

Step 10 Click **Start Operation** to up the connection.

If successful, the Loopback Connection window appears.

Step 11 Click **Abort Operation** to stop the operation.

Managing Security

This chapter describes Cisco MGM security and how to manage users. This includes an overview of security domains and a description of the user security and NE security features available in Cisco MGM.

This chapter contains the following sections:

- 8.1 What Is Security Management?
- 8.2 How Do I Customize the Login Advisory Message?
- 8.3 How Do I Manage User Security?
- 8.4 How Do I Manage the Audit Log?

8.1 What Is Security Management?

Why create a security policy?

- To create a baseline of your current security posture
- To set the framework for security implementation
- To define allowed and disallowed behaviors
- To help determine necessary tools and procedures
- To communicate consensus and define roles
- To define how to handle security incidents

The following security domains govern Cisco MGM networks:

- Cisco MGM client—A Cisco MGM client must be created with one of the existing default user profiles or with a new custom user profile with appropriate access privileges. This new user profile should be created and assigned to a user.
- Cisco MGM OSS users—OSS-to-Cisco MGM sessions are configured by the Cisco MGM CORBA GateWay EMS-to-NMS interface architectural component. For more information about Cisco MGM CORBA GateWay, see Chapter 12, “Managing CORBA Interfaces.”

8.2 How Do I Customize the Login Advisory Message?

After logging into the Cisco MGM client, a login advisory message is shown. By default, the advisory message reads:

```
NOTICE: This is a private computer system. Unauthorized access or use may lead to
prosecution.
```

You can customize the default advisory message as follows:

Step 1 Log into the Cisco MGM server as the root user.

Step 2 Use a text editor to edit or create the advisory.txt file in the /opt/CiscoMGMServer/cfg directory. The new advisory message can contain up to 1,600 characters. The advisory.txt file does not exist by default.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Step 3 Save the changes. All subsequent users who log into the Cisco MGM client will see the new advisory message.

Note You can also disable the advisory message altogether. See 8.3.4.13 Configuring Cisco MGM Security Parameters, page 8-28.

8.3 How Do I Manage User Security?

This section describes user security and management. This includes procedures on how to add a new user, modify a user's properties, delete a user, and end an active user session. It also includes procedures on how to add, modify, and delete custom profiles and how to perform NE user administration.

The following topics are covered:

- 8.3.1 Restricting User Access, page 8-2
- 8.3.2 Viewing the Audit Trail File, page 8-4
- 8.3.3 User Profiles, page 8-5
- 8.3.4 Performing User Administration, page 8-13

8.3.1 Restricting User Access

The Administration > Cisco MGM Users menu launched from the Domain Explorer window manages user security. Cisco MGM administration allows restricted access logins to enable users to perform tasks based on detailed access privileges.

For each action, a user is given privileges to read to read/write. For definitions of the access privileges, see Table 8-1.

Table 8-1 Configuration Center Access Privileges

Access Privilege	Operation
Read	Enables the following read operations: • Reads the element attributes. • Reads the templates and loads the template parameters into the configuration internal frame.
Read/Write	Enables the following create operations: • Changes the attribute values in a create internal frame. • Commits changes on the switch. • Saves the attribute values into a new template. Enables the following modify operations: • Changes the attribute values in a details internal frame. • Commit changes on the switch. • Saves the attribute values into an existing template. • Selects and modifies the template with the new attribute values. Enables the **Delete** button in both the details and create internal frame only after the element is created. Also in the tabular view listing, when more than one element is selected and if you click **Delete**, an extra check verifies if the multiple delete permission is enabled, If not, you are blocked from attempting the operation and prompted to delete one element at a time. Specifies that the tabular view listing allows more than one element decision. The multiple delete operation means that the single delete operation is also enabled. The other delete permissions are also applicable.
No Access	User has no access permissions.

Table 8-2 lists the access privileges required to perform security-controlled operations within the Diagnostic Center application.

Table 8-2 Diagnostic Center Access Privileges

Access Privilege	Operation
Read	Enables get connections, test connections, connection trace, and trouble tickets attachment.
Read/Write	Enables up connections, and saves trouble tickets. Enables the following operations at different levels: • Node—Specifies node resync and checks manageability. • Line and path—Applies loopback and starts and modifies BERT[1]. • Port—Starts and modifies BERT and grooming functions. • Connections—Specifies loopback connections.
No Access	User has no access permissions.

1. BERT = Bit Error Rate Test

To perform security-controlled operations within Chassis View and Statistics Reporting Tool applications, Read is the only access privilege allowed. The Read access privilege enables all operations that are supported by the application.

8.3.2 Viewing the Audit Trail File

The Cisco MGM Audit Trail Viewer records activities across the four applications (Configuration Center, Chassis View, Statistics Reporting Tool, and Diagnostic Center) in a persistent file.

Note Audit trail logging is done per Cisco MGM workstation and each workstation performs an independent audit trail file. There is no communication or synchronization between workstations regarding an audit trail.

Using the Audit Trail Viewer, you can access audit trail files for specified days, and you can sort, filter, and search for specific log entries. All readand write activities are monitored and logged to a file. To open the Audit Trail Viewer, complete the following procedure:

Step 1 From the Cisco MGM Domain Explorer window, choose **Administration > MGX 8880/8850 MG > Audit Trail**.

Note If no NE is selected in the Domain Explorer, the Audit Trail option will be grayed out.

or

from the Configuration Center, Statistics Reporting Tool, Chassis View, or Diagnostic Center:

- Choose **Tools > Administration > Cisco MGM Audit Trail**
- Right-click on any object in the Hierarchy pane and choose **Administration > Cisco MGM Audit Trail**

Step 2 Enter the fields.

Note Table 8-3 describes fields in the Cisco MGM Audit Trail Viewer.

Step 3 Click **Submit** to submit the specified criteria for the log file.

Step 4 Click **Reset All** to reset all the fields to the default state.

Table 8-3 Field Descriptions for the Cisco MGM Audit Trail Viewer

Name	Description
Date	Specifies the days to view the audit trail for. Click in the **Date** field to populate the current date. If the Date field is not checked, all files in the directory are checked. The format is *MMDDYYYY*.
Time	Specifies the start and end times. The format is *HH:MM:SS*. If the Time field is not checked, time is not set as a filter.

Table 8-3 Field Descriptions for the Cisco MGM Audit Trail Viewer (continued)

Name	Description
Host Name	Specifies the host workstation name where the audit trail record is generated. If the Host Name field is not checked, all host names are displayed. This field corresponds to the Terminal column in the table. **Note** The exact hostname must be specified.
User Id	Specifies the user ID used to log into the Cisco MGM desktop. If the User Id field is not checked, all user IDs are used.
Application	Specifies the application name. If the Application field is not checked, all applications are used. You have the following application choices: • All • Chassis View • Configuration Center • Diagnostics Center • Statistics Reporting Tool
Event Type	Displays the type of user activity: • Write (Initial, Failed, Successful, Timeout, and Abort) • Read • Read and Write This field corresponds to the Status column in the table.
Max entries per page	Specifies the maximum entries displayed per page in the table. The maximum is 50.
Total	Displays the total entries found and the number of entries on the current page.
<<	Displays the previous page entries.
>>	Displays the next page entries.

8.3.3 User Profiles

By default, Cisco MGM contains the following user profiles:

- NetworkAdmin—Typically, NOC supervisors who perform daily network surveillance, provisioning, and performance monitoring activities on any group or NE.
- Operator—Users who perform daily network surveillance and performance monitoring activities on specific NEs. Each operator can have only one active session. Operators cannot access administrative information.
- Provisioner—Users who perform daily network surveillance, provisioning, and performance monitoring activities on specific NEs. Each provisioner can have only one active session. Provisioners cannot access administrative information.
- SuperUser—Users who have access to all operations.
- SysAdmin—System administrators who manage Cisco MGM access.

The following sections describe how to view, add, modify, delete, and duplicate a user profile:

- 8.3.3.1 Viewing User Profiles
- 8.3.3.2 Adding a Custom User Profile
- 8.3.3.3 Modifying a User Profile
- 8.3.3.4 Deleting a User Profile
- 8.3.3.5 Duplicating a User Profile

8.3.3.1 Viewing User Profiles

The Cisco MGM User Profiles table displays basic information about Cisco MGM user profiles. Use the menu options to manage user profiles.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Cisco MGM User Profiles** (or click the **Launch User Profiles Table** tool). Table 8-4 describes the fields in the Cisco MGM User Profiles table.

Table 8-4 Field Descriptions for the Cisco MGM User Profiles Table

Field	Description
User Profile Name	Name of the existing Cisco MGM user profiles.
NE Assignment	NE assignment for the selected user profile. NE assignments are: • Assign all NEs—SuperUser, NetAdmin • Assign NEs—Operator, Provisioner • Assign no NEs—SysAdmin When you create a new profile, only Assign NEs is available for the new profile, meaning that NEs or groups must always be assigned to the new profile.
Login Sessions	Number of permitted simultaneous logins assigned to the user profile: • 1—Only one user with a given profile can log into a specific Cisco MGM server at a time. • 2 to 10—The specified number of users (2 to 10) with a given profile can log into a specific Cisco MGM server simultaneously. • Unlimited—An unlimited number of users with a given profile can log into a specific Cisco MGM server simultaneously.
Description	Description of the user profile.

8.3.3.2 Adding a Custom User Profile

Cisco MGM allows SuperUsers and SysAdmins to generate custom user profiles with certain privileges. Custom user profiles are grouped into categories and each category has a set of operations (see Table 8-6). After the user profiles are generated, they can be assigned to new Cisco MGM users. This functionality, also known as network partitioning, allows you to control how much access particular users have to the network.

Use the Create New User Profile wizard to add Cisco MGM user profiles. Table 8-5 describes the fields in the wizard.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Cisco MGM User Profiles** (or click the **Launch User Profiles Table** tool).

Step 3 In the Cisco MGM User Profiles table, choose **Edit > Create** (or click the **Create a New User Profile** tool).

Step 4 In the Create New Cisco MGM User Profile wizard, specify the following:

- User profile name
- NE assignment (read only)
- Default user login sessions allowed
- Description

Step 5 Click **Next**.

Step 6 Select a user profile category from the Categories area. Operations for each category are displayed on the right side of the Categories area. See Table 8-6 for a complete list of Cisco MGM profile categories and operations.

Step 7 Specify user capabilities by setting permission or privileges for one or all operations. When setting privileges for each operation, select one of the following radio buttons:

- Read Only
- Read/Write
- No Access

When setting privileges for all operations, select one of the following buttons:

- Set All Read Only
- Set All Read/Write
- Set All No Access

Note The user profile operations displayed on the right side of the Create New Cisco MGM User Profile wizard depend on the category selected. You can select the root node to see all the operations for all categories.

Step 8 Click **Finish**.

Step 9 Click **Yes** in the message box. The message box will not be displayed if it is disabled in the User Preferences dialog box. See 8.3.4.11 Setting User Preferences, page 8-26 for more information.

Table 8-5 Field Descriptions for the Create New User Profile Wizard

Field	Description
User Profile Name	Enter the name of the new user profile. The profile name must contain between six and twenty alphanumeric characters (A-Z, a-z, 0-9). Alphabetic characters are case-sensitive. The profile name must be unique in Cisco MGM and cannot contain a space or any special characters.
NE Assignment	(Read only) The NE assignment for the new user profile. Values are: • Assign All NEs—SuperUser, NetworkAdmin • Assign NEs—Operator, Provisioner • Assign No NEs—SysAdmin When you create a new profile, only Assign NEs is available for the new profile, meaning that NEs or groups must always be assigned to the new profile.
Default User Login Sessions	Choose to allow single or multi-user sessions.
Description	Enter a description of the new user profile.
User Profile Privileges	Set user privileges for specific Cisco MGM categories. Select a category in the left panel to display that category's available operations. Select an operation from the Operations column; then, select a user privilege for the selected operation from the radio buttons in the Privileges column. • Set All Read Only—Specifies that the user can only view information related to all the operations with Read Only privilege listed under the specified category. All other operations will be set to No Access. • Set All Read/Write—Specifies that the user can view and perform any of the operations with Read/Write privilege listed under the specified category. All other operations will be set to Read Only. • Set All No Access—Specifies that the user is not allowed to perform any of the operations with No Access privilege listed under the specified category. All other operations will be set to Read Only. The Warning column lists the dependencies between various operations. After you click **Finish** to create the new user profile, a warning dialog box lists all of the warning messages. If you check the **Don't Display User Profile Creation Warning Messages** check box, the warning dialog box does not appear for subsequent user profile creations in the current client session. If you check the **Don't Display User Profile Creation Warning Messages** check box in the User Preferences dialog box, the warning dialog box is disabled as specified for the current user or as a template for new users.

Table 8-6 Cisco MGM Custom User Profiles

Category	Operations	Description	Privileges
Administration	Audit/Error Log	Launch the Audit Log and Error Log.	Read Only or No Access
	Control Panel	Launch the Control Panel and related tables.	Read/Write or No Access
	Logged In MGM Users	Launch the Logged In MGM Users Table.	Read Only, Read/Write, or No Access
	MGM User Profiles	Launch the Cisco MGM User Profiles Table and add, delete, or modify user profiles.	Read Only, Read/Write, or No Access
	MGM Users	Launch the MGM Users Table and add, delete, or modify users and user preferences.	Read Only, Read/Write, or No Access
	Save Map As Default	Save map customizations as default.	Read/Write or No Access
NE Administration	Add or Delete NE or Group	Add or delete NEs or groups from the domain.	Not assigned
	Audit Trail	Launch the Audit Trail Table.	Read Only, Read/Write, or No Access
	Edit Domain Node Properties	Edit properties on the property sheet associated with the root node in the Domain Explorer tree.	Read/Write or No Access
	Edit NE or Group Properties	Edit NE or group properties.	Read/Write or No Access
	SSH Secure Shell	Command line tool to gain secure shell access to MGX switches.	Read/Write, or No Access
	Supported NE Table	Launch the Supported NE Table.	Read Only, Read/Write, or No Access
	Telnet session	Command line tool to telnet to MGX switches.	Read/Write, or No Access
	Topology Modification	Drag, drop, cut, copy, and paste NEs in the Domain Explorer.	Not assigned
	User Preferences	Edit the user preferences.	Read/Write or No Access

Table 8-6 Cisco MGM Custom User Profiles (continued)

Category	Operations	Description	Privileges
NE CM[1]	Audit Logging in Chassis View	Activates or deactivates the Audit Trail in Chassis View.	Read Only, Read/Write, or No Access
	Audit Logging in Configuration Center	Activates or deactivates the Audit Trail in Configuration Center.	Read Only, Read/Write, or No Access
	Chassis View	Launches the Chassis View application.	Read Only, Read/Write, or No Access
	Configuration Center	Launches the Configuration Center application.	Read Only, Read/Write, or No Access
	Equipment Inventory	Launches the Equipment Inventory Table.	Read Only or No Access
NE FM[2]	Alarm Browser/Log	Launches the Alarm Browser, Alarm Log, or Event Export Manager, acknowledge alarms, and show alarm notes.	Read Only, Read/Write, or No Access
	Audit Logging In Diagnostics Center	Activates or deactivates the Audit Trail in the Diagnostics Center.	Read Only, Read/Write, or No Access
	Diagnostics Center	Launches the Diagnostic Center application.	Read Only, Read/Write, or No Access
	Show MGM EMS Alarms/Events	Show MGM-specific EMS alarms and events count in the Dashboard, show MGM specific EMS alarms in the Alarm Browser, and show MGM specific EMS alarms and events-related pop-ups.	Read/Write or No Access
NE Management	Audit Trail Table	Launches the Audit Trail table.	Read Only or No Access
	Job Monitor	Launch the Job Monitor Table and cancel job, cancel task, add user notes, or view user notes.	Read Only, Read/Write, or No Access
NE PM	Audit Logging in Statistics Reporting Tool	Activates or deactivates the Audit Trail in the Statistics Reporting Tool.	Read Only, Read/Write, or No Access
	Statistics Reporting Tool	Launches the Statistics Reporting Tool application.	Read Only, Read/Write, or No Access

1. NE Configuration Management
2. NE Fault Management

8.3.3.3 Modifying a User Profile

Use the Modify User Profile wizard to modify Cisco MGM user profiles. Table 8-5 describes the fields in the wizard.

Note Users created with a certain profile cannot be changed to another profile. To change profiles, the user must be deleted, then recreated with the new profile.

Modifying a profile will log out all users who are logged in with that profile.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Cisco MGM User Profiles** (or click the **Launch User Profiles Table** tool).

Step 3 In the table, click the user profile name to modify; then, choose **Edit > Modify** (or click the **Modify User Profile Properties** tool).

Step 4 In the Modify Cisco MGM User Profile wizard, modify the following:

- Default user login sessions allowed
- Description

Step 5 Click **Next**.

Step 6 Select a user profile category from the Categories area. Operations for each category are displayed on the right side of the Categories area. See Table 8-6 for a list of Cisco MGM profile categories and operations.

Step 7 Specify user capabilities by setting permission or privileges on one or all operations. When setting privileges for each operation, select one of the following radio buttons:

- Read Only
- Read/Write
- No Access

When setting privileges for all operations, select one of the following buttons:

- Set All Read Only
- Set All Read/Write
- Set All No Access

Note The user profile operations displayed on the right side of the Create New Cisco MGM User Profile wizard depend on the category selected. You can select the root node to see all the operations for all categories.

Step 8 Click **Finish**.

Step 9 Click **Yes** in the message box. The message box will not be displayed if it is disabled in the User Preferences dialog box. See 8.3.4.11 Setting User Preferences, page 8-26 for more information.

8.3.3.4 Deleting a User Profile

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Cisco MGM User Profiles** (or click the **Launch User Profiles Table** tool).

Step 3 In the Cisco MGM User Profiles table, select the profile you want to delete; then, choose **Edit > Delete** (or click the **Delete User Profile** tool).

Step 4 In the confirmation dialog box, click **OK**.

Note The default user profiles (SuperUser, SysAdmin, NetworkAdmin, Provisioner, and Operator) cannot be deleted. Custom user profiles cannot be deleted if they are assigned to any user. Delete the user with the custom user profile before deleting the user profile. See 8.3.4.5 Deleting a Cisco MGM User, page 8-23.

8.3.3.5 Duplicating a User Profile

Use the Create Duplicate Profile window to duplicate an existing Cisco MGM user profile.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Cisco MGM User Profiles** (or click the **Launch User Profiles Table** tool).

Step 3 In the Cisco MGM User Profiles table, select the profile you want to duplicate; then, choose **Edit > Duplicate** (or click the **Duplicate User Profile** tool).

Step 4 In the Create Duplicate Profile dialog box, enter the duplicate profile name. See Table 8-7 for name constraints.

Step 5 Click **OK**.

Table 8-7 Field Descriptions for the Create Duplicate Profile Window

Field	Description
Duplicate Profile Name	The name of the duplicate user profile must contain between six and twenty alphanumeric characters (A-Z, a-z, 0-9). Alphabetic characters are case-sensitive. The profile name must be unique in Cisco MGM and cannot contain a space or any special characters.

8.3.4 Performing User Administration

This section describes how to perform user administration, including:

- 8.3.4.1 Managing the Cisco MGM Default User Profiles
- 8.3.4.2 Viewing the Cisco MGM Users Table
- 8.3.4.3 Creating a Cisco MGM User
- 8.3.4.4 Modifying a Cisco MGM User's Properties
- 8.3.4.5 Deleting a Cisco MGM User
- 8.3.4.6 Viewing Logged In Cisco MGM Users
- 8.3.4.7 Ending an Active Cisco MGM User Session
- 8.3.4.8 Using the Cisco MGM Locked Window
- 8.3.4.9 Unlocking a User Account
- 8.3.4.10 Changing Your User Password
- 8.3.4.11 Setting User Preferences
- 8.3.4.12 Enabling or Disabling the Continuous Audible Alarm
- 8.3.4.13 Configuring Cisco MGM Security Parameters
- 8.3.4.14 Sending Messages to Other Users
- 8.3.4.15 Viewing User Notification Messages

8.3.4.1 Managing the Cisco MGM Default User Profiles

Table 8-8 lists the Cisco MGM default user profiles and the privileges associated with each profile.

Note The SuperUser profile has access to all operations, and is not specifically listed in a separate column.

The NetworkAdmin profile has access to all NEs and groups. The SysAdmin profile has access to no NEs or groups.

Table 8-8 Cisco MGM Default User Profiles

Functional Area	Operation	SysAdmin	NetworkAdmin	Provisioner	Operator
Domain Explorer	File > New Group	Deny	Allow	Deny	Deny
	File > Add Network Element(s)	Deny	Allow	Deny	Deny
	File > Dashboard	Allow	Allow	Allow	Allow
	File > Network Map	Deny	Allow	Allow	Allow
	File > Domain NE table	Deny	Allow	Allow	Allow
	File > Notify Users	Allow	Allow	Allow	Allow
	File > Refresh Data	Allow	Allow	Allow	Allow
	File > Debug Options	Allow	Allow	Allow	Allow
	File > Lock Cisco MGM Client	Allow	Allow	Allow	Allow
	Edit > Cut	Deny	Allow	Deny	Deny
	Edit > Copy	Deny	Allow	Deny	Deny
	Edit > Paste	Deny	Allow	Deny	Deny
	Edit > Delete	Deny	Allow	Deny	Deny
	Edit > Delete All	Deny	Allow	Deny	Deny
	Edit > Undelete	Deny	Allow	Deny	Deny
	Edit > Expand	Deny	Allow	Allow	Allow
	Edit > Collapse	Deny	Allow	Allow	Allow
	Edit > Find	Deny	Allow	Allow	Allow
	Edit > Find Next	Deny	Allow	Allow	Allow
	Edit > User Preferences	Allow	Allow	Allow	Allow
	Edit > Change Password	Allow	Allow	Allow	Allow
	Fault > Alarm Browser	Allow	Allow	Allow	Allow
	Fault > Alarm Log	Allow	Allow	Allow	Allow

Table 8-8 Cisco MGM Default User Profiles (continued)

Functional Area	Operation	SysAdmin	NetworkAdmin	Provisioner	Operator
Domain Explorer (continued)	Fault > Event Export Manager	Allow	Allow	Allow	Allow
	Fault > Ping NE (*not applicable*)	Deny	Deny	Deny	Deny
	Fault > Test NE Connectivity (*not applicable*)	Deny	Deny	Deny	Deny
	Fault > Stop Continuous Beep	Deny	Allow	Allow	Allow
	Fault > MGX 8880/8850 MG > Diagnostic Center	Deny	Allow	Allow	Deny
	Performance > MGX 8880/8850 MG > Statistics Reporting Tool	Deny	Allow	Allow	Deny
	Configuration > MGX 8880/8850 MG > Equipment Inventory Table	Deny	Allow	Allow	Allow
	Configuration > MGX 8880/8850 MG > Chassis View	Deny	Allow	Allow	Deny
	Configuration > MGX 8880/8850 MG > Configuration Center	Deny	Allow	Allow	Deny
	Administration > Job Monitor	Deny	Allow	Allow	Deny
	Administration > Service Monitor	Allow	Deny	Deny	Deny
	Administration > Self Monitor	Allow	Deny	Deny	Deny
	Administration > Memory Backup	Deny	Deny	Deny	Deny
	Administration > Memory Restore	Deny	Deny	Deny	Deny
	Administration > Software Download	Deny	Deny	Deny	Deny
	Administration > Image Upload (*not applicable*)	Deny	Deny	Deny	Deny
	Administration > NE Software table (*not applicable*)	Deny	Deny	Deny	Deny
	Administration > Cisco MGM Users	Allow	Deny	Deny	Deny
	Administration > Control Panel	Allow	Deny	Deny	Deny
	Administration > Audit Log	Allow	Allow	Deny	Deny
	Administration > Error Log	Allow	Allow	Deny	Deny
	Administration > Supported NE table	Allow	Allow	Deny	Deny
	Administration > MGX 8880/8850 MG > Audit Trail	Deny	Allow	Deny	Deny

Table 8-8 Cisco MGM Default User Profiles (continued)

Functional Area	Operation	SysAdmin	NetworkAdmin	Provisioner	Operator
Network Map	File > Open	Deny	Allow	Allow	Allow
	File > Parent	Deny	Allow	Allow	Allow
	File > Save	Deny	Allow	Allow	Allow
	File > Save As Default	Deny	Allow	Deny	Deny
	File > Revert To Default	Deny	Allow	Allow	Allow
	File > Notify Users	Deny	Allow	Allow	Allow
	File > Refresh Data	Deny	Allow	Allow	Allow
	File > Debug Options	Deny	Allow	Allow	Allow
	Edit > Enable Drag	Deny	Allow	Allow	Allow
	Edit > Enable Offview	Deny	Allow	Allow	Allow
	Edit > Change Map Background	Deny	Allow	Allow	Allow
	Edit > Change Node Icon	Deny	Allow	Allow	Allow
	Edit > Zoom In	Deny	Allow	Allow	Allow
	Edit > Zoom Out	Deny	Allow	Allow	Allow
	Edit > Zoom Area	Deny	Allow	Allow	Allow
	Edit > Circular Layout	Deny	Allow	Allow	Allow
	Edit > Spring Layout	Deny	Allow	Allow	Allow
	Edit > Table Layout	Deny	Allow	Allow	Allow
	Edit > Declutter Layout	Deny	Allow	Allow	Allow
	Edit > User Preferences	Deny	Allow	Allow	Allow
	Edit > Change Password	Deny	Allow	Allow	Allow
Alarm Browser	Fault > Acknowledge Alarms	Allow	Allow	Allow	Allow
	Fault > Acknowledge All Alarms	Allow	Allow	Allow	Allow
	Fault > Clear Alarm(s)	Allow	Allow	Allow	Allow
	Fault > Show Alarm Note	Allow	Allow	Allow	Allow
	Fault > Hide Cleared Alarms	Allow	Allow	Allow	Allow
	Fault > Hide Acknowledged Alarms	Allow	Allow	Allow	Allow
	Fault > Reset All Alarms	Allow	Allow	Allow	Allow
Job Monitor	Edit > Cancel Task	—	Allow	—	—
	Edit > Cancel Job	—	Allow	—	—
	Edit > User Note	—	Allow	—	—
	Edit > NE Software table (*not applicable*)	—	Deny	—	—

Table 8-8 Cisco MGM Default User Profiles (continued)

Functional Area	Operation	SysAdmin	NetworkAdmin	Provisioner	Operator
Cisco MGM Users	Edit > Create	Allow	—	—	—
	Edit > Modify	Allow	—	—	—
	Edit > Delete	Allow	—	—	—
	Edit > Unlock	Allow	Deny	Deny	Deny
	Administration > Cisco MGM User Profiles	Allow	Deny	Deny	Deny
	Administration > Logged In Cisco MGM Users	Allow	Deny	Deny	Deny
Cisco MGM User Profiles	Edit > Create	Allow	Deny	Deny	Deny
	Edit > Modify	Allow	Deny	Deny	Deny
	Edit > Delete	Allow	Deny	Deny	Deny
	Edit > Duplicate	Allow	Deny	Deny	Deny
Logged In Cisco MGM Users table	Administration > Log Out User	Allow	Deny	Deny	Deny
Supported NE table	Edit > Add	Allow	Allow	—	—
	Edit > Delete	Allow	Allow	—	—

8.3.4.2 Viewing the Cisco MGM Users Table

The MGM Users table displays basic information about Cisco MGM users. The table menu options allow you to create new users, modify users, delete users, and unlock user accounts.

To view the MGM Users table, choose **Administration > Cisco MGM Users** in the Domain Explorer window. Table 8-9 describes the fields in the table.

Table 8-9 Field Descriptions for the MGM Users Table

Field	Description
Username	Username of the selected MGM user.
User Privilege	User privilege level (SuperUser, SysAdmin, NetworkAdmin, Provisioner, Operator, or a custom profile).
User Domain	Name of the management domain where the username belongs.
Password Set Time (*time zone*)	Last time the password was set.
Locked State	Whether the user's account is locked or unlocked. If the user repeatedly attempts unsuccessfully to log into the Cisco MGM client (the default maximum is 5 attempts), the user's account is locked automatically. You can set the maximum number of login attempts a user is allowed before being locked out in the **Control Panel > Security Properties** pane.
Last Login Time (*time zone*)	Last time the user logged in.
Failed Attempts	Number of times the user tried to log in, but failed.
Login State	Administrative state (Enabled or Disabled) of the user.

Table 8-9 Field Descriptions for the MGM Users Table (continued)

Field	Description
Description	Description of the user.
Password Change	Current state (Enabled or Disabled) of the password change option.
Multiple Login	Whether this user is allowed to perform multiple logins simultaneously.

8.3.4.3 Creating a Cisco MGM User

Use the Create New MGM User wizard to add new Cisco MGM users to the domain. Table 8-10 describes the fields in the wizard.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the MGM Users table, choose **Edit > Create** (or click the **Create a New User** tool).

Step 3 In the Create New MGM User wizard, enter the following information:

- Username
- User password (and confirm password)
- User privilege
- Domain name
- Login state
- Password change
- Description
- Use Global Settings check box
- Enable check box
- Period
- User login sessions

Step 4 Click **Next**. When you finish adding a new SuperUser, NetworkAdmin, or SysAdmin, click **Finish**.

Step 5 When adding a new Provisioner, Operator, or custom user profile, select the groups and NEs that the Provisioner or Operator will monitor. Selected groups and NEs appear in the Assigned Objects list. (SuperUsers and NetworkAdmins monitor the entire management domain, so there is no need to select groups or NEs when adding one of these users. SysAdmin users do not access any of the NEs.)

a. To assign groups, click the **Groups** radio button. In the Available Objects list, select the groups that will be assigned to the new user and click **Add**.

b. To assign NEs, click the **Network Elements** radio button. In the Available Objects list, select the NEs that will be assigned to the new user and click **Add**.

Note When individual NEs are assigned, these NEs will appear directly under the top level domain for the user in the Domain Explorer. It is possible that a given NE may have already been assigned as part of a group assignment to the user. In such a case, the same NE will appear directly under the top level domain and also within the assigned group. This behavior is consistent with the Domain Explorer's ability to represent the same group or NE within multiple locations of the hierarchy.

c. To remove groups or NEs from the Assigned Objects list, select the group or NE from the Assigned Objects list and click **Remove**.

d. Click **Next** (or **Finish**).

Step 6 Click **Finish**.

The new user is listed in the MGM Users table.

Table 8-10 Field Descriptions for the Create New MGM User Wizard

Screen	Field	Description
User Properties	Username	Name that the user will use to access the system. The Cisco MGM username must contain between six and twelve alphanumeric characters (A-Z, a-z, 0-9). Alphabetic characters are case-sensitive. The username must be unique in Cisco MGM and cannot contain a space or a special character. **Note** After the username is set, it cannot be changed without deleting the user.
	User Password	Login password that the user will use to access the system. The password complexity is configurable in the Control Panel > Security Properties pane. By default, the user password must: • Contain at least six characters, but not more than 12 characters. • Contain at least two alphabetic characters (A-Z, a-z). Of the alphabetic characters, at least one must be uppercase and one must be lowercase. • Contain at least one numeric character (0-9). • Contain at least one special character (+ # % , . ; & !). • Not contain the username or any circular shift of the username. An uppercase letter and its corresponding lowercase letter are considered equivalent. For example, if the username is Arthur, the password cannot contain the string arthur, rthura, thurar, hurart, urarth, or rarthu. • Differ from the old password by at least three characters. For example, if the old password is MikeBrady5!, the new password cannot be mikebrady5% because only the last character is different. However, the new password MikeBrady2!99 is acceptable because it differs from MikeBrady5! by three characters. **Note** By default, the minimum time between password changes is 20 days. The new password must differ from the previous password by 3 characters, and the new password is compared against the previous 5 passwords.
	Confirm Password	Retype the password to confirm it.
	User Privilege	User privilege level. **Note** After the user privilege is set, it cannot be changed without deleting the user.

Table 8-10 Field Descriptions for the Create New MGM User Wizard (continued)

Screen	Field	Description
User Properties (continued)	Domain Name	Domain name. When the user logs into the system, he or she sees all of the devices contained within this domain.
	Login State	Permit (enable) or prevent (disable) the user from logging into the system.
	Password Change	Permit (enable) or prevent (disable) the user from changing his or her password.
	Description	Description of the new user.
	Use Global Settings/ Enable check boxes	Lockout—Cisco MGM automatically locks the current session after the period in the Period field. Click **Use Global Settings** to use the settings from the Security window. If you do not select Use Global Settings, click **Enable** to activate lockout for the selected user. Enter a lockout length in the Period field.
		Logout—Cisco MGM automatically logs the user out of the Cisco MGM session after the period in the Period field. Click **Use Global Settings** to use the settings from the Security window. If you do not select Use Global Settings, click **Enable** to activate logout for the selected user. Enter a logout length in the Period field.
	User Login Sessions	Select whether to allow single or multiple user logins.
Assign Objects to User (*for Provisioner and Operator users only*)	Select Object Type	Assign groups or NEs to the new user. **Note** The Discovered NEs and Deleted NEs groups cannot be assigned to a Provisioner, Operator, or custom user profile.
	Select Objects	Select from the list of available objects that can be assigned to the new user. By clicking the **Add** and **Remove** buttons, you can move objects back and forth between the Available Objects list and the Assigned Objects list.

8.3.4.4 Modifying a Cisco MGM User's Properties

Use the Modify MGM User Properties wizard to modify the properties of an existing Cisco MGM user. Table 8-11 describes the fields in the wizard.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, select the user whose properties will be modified.

Step 3 Choose **Edit > Modify** (or click the **Modify User Properties** tool). The Modify MGM User Properties wizard opens.

Step 4 Modify the following information, as needed; then, click **Next**:

- Username
- User password (and confirm password)
- User privilege
- Domain name
- Login state
- Password change
- Description
- Use Global Settings check box

- Enable check box
- Period
- User login sessions

Step 5 (Optional) For Provisioner, Operator, and custom user profiles, modify the list of assigned objects by adding groups or NEs to the Assigned Objects list or removing groups or NEs from the list. Click **Next**.

Step 6 Click **Finish**. The user whose properties were modified is listed in the MGM Users table.

Table 8-11 Field Descriptions for the Modify MGM User Properties Wizard

Screen	Field	Description
Cisco Media Gateway Manager User Properties	Username	(Read-only) Active username for accessing the system. The Cisco MGM username must contain between six and twelve alphanumeric characters (A-Z, a-z, 0-9). Alphabetic characters are case-sensitive. The username must be unique in Cisco MGM and cannot contain a space or a special character. **Note** Once the username is set, it cannot be changed without deleting the user.
	User Password	Login password used to access the system. The password complexity is configurable in the Control Panel > Security Properties pane. By default, the user password must: • Contain at least six characters, but not more than 12 characters. • Contain at least two alphabetic characters (A-Z, a-z). Of the alphabetic characters, at least one must be uppercase and one must be lowercase. • Contain at least one numeric character (0-9). • Contain at least one special character (+ # % , . ; & !). • Not contain the username or any circular shift of the username. An uppercase letter and its corresponding lowercase letter are considered equivalent. For example, if the username is Arthur, the password cannot contain the string arthur, rthura, thurar, hurart, urarth, or rarthu. • Differ from the old password by at least three characters. For example, if the old password is MikeBrady5!, the new password cannot be mikebrady5% because only the last character is different. However, the new password MikeBrady2!99 is acceptable because it differs from MikeBrady5! by three characters. **Note** By default, the minimum time between password changes is 20 days. The new password must differ from the previous password by 3 characters, and the new password is compared against the previous 5 passwords.

Table 8-11 Field Descriptions for the Modify MGM User Properties Wizard (continued)

Screen	Field	Description
Cisco Media Gateway Manager User Properties (continued)	Confirm Password	Retype the password to confirm it.
	User Privilege	(Read-only) User's privilege level. **Note** The user privilege level cannot be modified without deleting the user.
	Domain Name	Domain name. When the user logs into the system, he or she sees all the devices contained within this domain.
	Login State	Permit (enable) or prevent (disable) the user from logging into the system.
	Password Change	Permit (enable) or prevent (disable) the user from changing his or her password.
	Description	User description.
	Autodisable Account	Number of days of non-use that will prompt the account to be automatically disabled. The range is 0 to 365 days in 1-day increments. The default is 0 days, meaning the account will not be disabled automatically as a result of non-use.
	Use Global Settings/ Enable check boxes	Lockout—Cisco MGM automatically locks the current session after the number of minutes in the Period field. Click **Use Global Settings** to use the settings from the Security window. If you do not select Use Global Settings, click **Enable** to activate lockout for the selected user. Enter a lockout length in the Period field.
		Logout—Cisco MGM automatically logs the user out of the Cisco MGM session after the number of minutes in the Period field. Click **Use Global Settings** to use the settings from the Security window. If you do not select Use Global Settings, click **Enable** to activate logout for the selected user. Enter a logout length in the Period field.
	User Login Sessions	Whether to allow single or multiple user login.
Assign Objects to User (*for Provisioner and Operator users only*)	Select Object Type	Assign specific groups and NEs to operator and provisioner users.
	Select Objects	Modify the objects that are assigned to operators and provisioners. Click **Add** and **Remove** to move objects back and forth between the Available Objects list and the Assigned Objects list.

8.3.4.5 Deleting a Cisco MGM User

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, select the user to be deleted.

Note A user cannot be deleted from the database until that user logs out. However, an active user session can be ended. See 8.3.4.7 Ending an Active Cisco MGM User Session, page 8-23.

Step 3 Choose **Edit > Delete** (or click the **Delete User** tool).

Step 4 Click **OK** to remove the user from the database.

8.3.4.6 Viewing Logged In Cisco MGM Users

The Logged In Cisco MGM Users table allows you to view the users who are currently logged into the Cisco MGM application.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Logged In Cisco MGM Users**. Table 8-12 describes the fields in the table.

Table 8-12 Field Descriptions for the Logged In Cisco MGM Users Table

Field	Description
Username	Name of the user who is currently logged in.
Logged in At	Date and time when the user logged in.
IP Address	User's IP address.
Session ID	Unique session ID number that the Cisco MGM server assigns to each Cisco MGM user during login.

8.3.4.7 Ending an Active Cisco MGM User Session

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, choose **Administration > Logged In Cisco MGM Users**.

Step 3 In the Logged In Cisco MGM Users table, select the user whose session will be ended and choose **Administration > Log Out User** (or click the **Log Out User** tool).

Step 4 Click **Yes** at the following prompt:

```
This operation will log out the selected Cisco MGM user. It will take approximately
a minute and this Cisco MGM client will be unusable until then. Do you wish to continue?
```

Wait while the Cisco MGM server logs out the selected Cisco MGM client. The Cisco MGM GUI is frozen for approximately 1 minute until the request is complete.

8.3.4.8 Using the Cisco MGM Locked Window

You can use the Cisco MGM Locked window to lock the current Cisco MGM session:

From the Domain Explorer window, choose:

File > Lock Cisco MGM Client

or

File > Lock Cisco MGM Users

Once the session is locked, the Domain Explorer disappears, and the Cisco MGM Locked window prompts you to enter your password to unlock the Cisco MGM session. You can attempt login up to the configured maximum login attempts to unlock the session. If the threshold is exceeded, Cisco MGM will terminate. Table 8-13 describes the field in the Cisco MGM Locked window.

Table 8-13 Field Descriptions for the Cisco MGM Locked Window

Field	Description
Password	Enter your password; then, click **Unlock** to unlock the Cisco MGM session.

8.3.4.9 Unlocking a User Account

By default, Cisco MGM allows users a maximum of five login attempts; the user account is locked after the fifth unsuccessful login attempt. The lockout duration is configurable and can be from 0 to 600 seconds or infinite.

Step 1 In the Domain Explorer window, choose **Administration > Cisco MGM Users**.

Step 2 In the Cisco MGM Users table, select the locked user.

Step 3 Choose **Edit > Unlock (or** click the **Unlock User** tool).

8.3.4.10 Changing Your User Password

Cisco MGM users can use the Change Password dialog box to change their Cisco MGM passwords at any time. The password change applies to the Cisco MGM user who is currently logged in. There is an enforced password change request when the default user logs in for the first time. If the user does not change the password, the Cisco MGM session is canceled.

Note The password complexity is configurable in the Control Panel > Security Properties pane.

Table 8-14 describes the fields in the Change Password dialog box.

Step 1 In the Domain Explorer window, choose **Edit > Change Password**.

Step 2 To change the Cisco MGM password:

a. In the Cisco MGM Password area, enter the current Cisco MGM password in the Old Password field.

b. Enter the new password in the New Password field. For Cisco MGM password constraints, see Table 8-14.

c. Confirm the new password.

d. Click **OK**.

Table 8-14 Field Descriptions for the Change Password Dialog Box

Field	Subfield	Description
Cisco MGM Password	Old Password	Enter the old Cisco MGM user password.
	New Password	Enter the new login password. The password complexity is configurable in the Control Panel > Security Properties pane. By default, the new password must: • Contain at least six characters, but not more than 12 characters. • Contain at least two alphabetic characters (A-Z, a-z). Of the alphabetic characters, at least one must be uppercase and one must be lowercase. • Contain at least one numeric character (0-9). • Contain at least one special character (+ # % , . ; & !). • Not contain the username or any circular shift of the username. An uppercase letter and its corresponding lowercase letter are considered equivalent. For example, if the username is Arthur, the password cannot contain the string arthur, rthura, thurar, hurart, urarth, or rarthu. • Differ from the old password by at least three characters. For example, if the old password is MikeBrady5!, the new password cannot be mikebrady5% because only the last character is different. However, the new password MikeBrady2!99 is acceptable because it differs from MikeBrady5! by three characters. **Note** By default, the minimum time between password changes is 20 days. The new password must differ from the previous password by 3 characters, and the new password is compared against the previous 5 passwords.
	Confirm Password	Retype the password to confirm it.

Note Do not change the Cisco MGM passwords at the same time in the Change Password dialog box.

It is possible to set up the user account such that the change password function is disabled. See the description of the Password Change field in 8.3.4.3 Creating a Cisco MGM User, page 8-18.

8.3.4.11 Setting User Preferences

Use the User Preferences dialog box to configure the Cisco MGM user interface.

Step 1 In the Domain Explorer window, choose **Edit > User Preferences**. The User Preferences dialog box opens. Table 8-15 describes the fields in the dialog box.

Step 2 After specifying the settings, check the **Save current settings** check box to preserve the current settings even after logging out. Users with the appropriate privileges can check the **Save as the default user template** check box to save the current settings as the default for new users who are added in the future. Current users who have not altered their default settings adopt the new default settings when they log out.

Step 3 Click **OK** to save the settings. After you save the selections, all subsequent views use the saved preferences.

Table 8-15 Field Descriptions for the User Preferences Dialog Box

Tab	Field	Description
Event Notification	Show Notification Dialog For	Select whether an alert popup displays when a specific alarm or event occurs on NEs in your management domain or on the EMS. You can specify the alarm severity that will generate an alert popup, and whether to include cleared alarms. **Note** Selections that apply to NEs are allowed only if you have NEs assigned to you. Selections that apply to the EMS are allowed only if you have the appropriate user privilege.
	Play Audible Notification For	Select whether an audible alert sounds when a specific alarm or event occurs on an NE or on the Cisco MGM application. You can specify the alarm severity that will generate an audible alert, and whether to include cleared alarms. Check the **Continuous Alarm for Dashboard Notifications** check box to enable continuous audible notification whenever a new update occurs in the Dashboard window. Uncheck this check box to disable continuous audible notifications. **Note** Selections that apply to NEs are allowed only if you have NEs assigned to you. Selections that apply to the EMS are allowed only if you have the appropriate user privilege.

Table 8-15 Field Descriptions for the User Preferences Dialog Box (continued)

Tab	Field	Description
Miscellaneous	Time Zone for Date/Time Display	Change the time zone selection. You can select one of the following: • Local—Displays time information adjusted for the time zone that is configured on the PC or workstation where the Cisco MGM client is running. • GMT—Displays time information (for example, alarm time stamps) according to the GMT time zone. • User Defined—Specify a fixed offset from GMT. The offset range is –12 to +13 hours from GMT, in one-hour increments. For offsets other than zero, specify a display string of four characters maximum (to indicate the time zone, for example).
	Display Log/15-min PM Data	Change the time period used to display time-sensitive data in 15-minute increments. **Note** This field is visible only if you have read permission for the Performance Monitor operation.
	Display 1 Day PM Data	Change the time period used to display time-sensitive data in 24-hour increments. **Note** This field is visible only if you have read permission for the Performance Monitor operation.
	Don't Display User Profile Creation Warning Messages	Enable or disable the warning dialog box that pops up when you click Finish after creating or modifying a user profile. The warnings are still visible in the User Profile table.
Map Preferences	Open Network Map in New Window	Within network map views, this setting specifies whether to open subsequent frames in the same window, or open a new window for subsequent map views.
	Show Off View Icons	This option is available in the GUI, but is not used by Cisco MGM.
FM Preferences	Color Entire Row in Table View	Set the Alarm Browser or Alarm Log to full background color for the entire selected row. The color corresponds to the alarm status and severity.

8.3.4.12 Enabling or Disabling the Continuous Audible Alarm

You can enable or disable the continuous audible alarm, which can be enabled to sound when a specific alarm or event of a specific severity occurs on an NE or on the system.

Step 1 In the Domain Explorer window, choose **Edit > User Preferences**. The User Preferences dialog box opens.

Step 2 In the **Event Notification tab > Play Audible Notification For** area, check the **Continuous Alarm For Dashboard Notifications** check box.

Step 3 Click **OK**.

Step 4 To disable the continuous audible alarm, choose **Fault > Stop Continuous Beep** in the Domain Explorer window.

8.3.4.13 Configuring Cisco MGM Security Parameters

Use the Security Properties pane to configure Cisco MGM security parameters and password complexity rules. You can also specify usernames and passwords.

Note Passwords that are already in the system are not affected by modification(s) to the password complexity rules. The password complexity rules are checked when:

- A privileged user adds a new user to the system
- A privileged user modifies an existing user's password
- A user changes his or her own existing password

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 Click **Security Properties** and set the parameters described in Table 8-16.

Step 3 Click **Save**.

Table 8-16 Field Descriptions for the Security Properties Pane

Tab	Field	Description
Cisco MGM Security	Password Aging	Number of days before the password expires. The user is prompted to change the password after the specified number of days. The range is 0 to 999 days; the default is 30 days. A value of 0 disables this feature.
	Max Retries	Maximum number of login attempts a user is allowed before being denied access. The range is 0 to 10 retries; the default is 5 retries. A value of 0 disables this feature. **Note** When the number of login attempts is exceeded for a given user, Cisco MGM generates an alarm. Alarm information includes the username and IP address of the client workstation where the final login attempt was made.
	Infinite	Enable or disable infinite user lockout. If checked, Cisco MGM does not automatically re-enable the account, but always requires the intervention of a user with the appropriate user profile to re-enable.
	Login Disable Period	Number of seconds a user's login is disabled after the maximum login retries value is exceeded. The range is 0 to 600 seconds; the default is 30 seconds. A value of 0 disables this feature and the Max Retries feature. For example, if the maximum number of retries is 5 and the login disable period is 30 seconds, the user account will be disabled for 30 seconds after the fifth failed login attempt. **Note** If you check the Infinite check box, the Login Disable Period field is grayed out. The user will not be allowed to log in until that user's login state is re-enabled from the Cisco MGM Users table.
	Enable Cisco MGM Security Advisory Message	If checked, the advisory message that appears on login is enabled. Uncheck to disable the login advisory message.
	Lockout Enable	If checked, Cisco MGM automatically locks the current session after the period in the Lockout Period field. **Note** If both Lockout Enable and Logout Enable are checked, logout only occurs after the lockout period.
	Lockout Period	Number of minutes a user's Cisco MGM session is inactive before Cisco MGM automatically locks the user out. The range is 0 to 120 minutes in 1-minute increments; the default is 30 minutes. A value of 0 disables this feature.
	Logout Enable	If checked, Cisco MGM automatically logs the user out of the Cisco MGM session after the period in the Logout Period field.
	Logout Period	Number of minutes a user's Cisco MGM session is inactive before Cisco MGM automatically logs the user out. The range is 0 to 1440 minutes in 1-minute increments. A value of 0 disables this feature.

8.3.4.14 Sending Messages to Other Users

Use the Notify Users dialog box to type and send a message to all Cisco MGM users, or to all Cisco MGM users with the same user privileges. For example, you might want to use the Notify Users dialog box to alert all Cisco MGM users before shutting down the Cisco MGM server.

Table 8-17 describes the fields in the dialog box.

Step 1 In the Domain Explorer window, choose **File > Notify Users**. The Notify Users dialog box opens.

Step 2 In the Message Targets area, select the recipients of the message.

Step 3 Type the message in the Message area.

Step 4 To send the message to the specified recipients, click **Send**. To cancel the message and close the dialog box, click **Cancel**. To launch the online help for the Notify Users dialog box, click **Help**.

Table 8-17 Field Descriptions for the Notify Users Dialog Box

Field	Description
Message Targets	Select recipients for your message. This list includes the default SuperUser, SysAdmin, NetworkAdmin, Provisioner, and Operator profiles, as well any custom user profile that has been generated. You can select custom and multiple profiles by using the Shift and Control keys while clicking the profile, or click the **All Cisco MGM Users** radio button to send your message to all users, regardless of user type.
Message	Type your message. The maximum length is 512 characters. If you enter a message that is longer than 512 characters, only the first 512 characters are sent.

8.3.4.15 Viewing User Notification Messages

The User Notification dialog box pops up on your screen when another user sends a message to a certain user profile or to all Cisco MGM users, and you belong to one of those groups. Table 8-18 describes the fields in the dialog box.

Table 8-18 Field Descriptions for the User Notification Dialog Box

Field	Subfield	Description
Message Received	From	Username of the user who sent you the message.
	Time	Date and time when you received the message.
Message	—	Text of the message. The maximum message length is 512 characters.

8.4 How Do I Manage the Audit Log?

The Audit Log table contains information about significant events (user-initiated changes and activities) that occurred on the Cisco MGM server during a specified time period. By default, the Audit Log displays information about significant events that occurred during the last four hours. You can change the default time period in the User Preferences dialog box. Each record has a time stamp, record type, and message string.

There are two types of audit log available in Cisco MGM:

- Audit logs for the Diagnostic Center, Configuration Center, Statistics Reporting Tool and Chassis View. These audit logs are accessed directly from the log directory on the server at /opt/svplus/log.
- Audit logs for the other applications in Cisco MGM. Choose **Administration** > **Audit Log** to view these Audit logs.

Audit Log data can be filtered, see section 8.4.2 Filtering Audit Log Data, page 8-32.

The Audit Log records the following runtime-affecting operations for monitoring purposes:

- Cisco MGM client logins, logouts, and security violations (including successful/unsuccessful client user logins and forced logouts)
- NE or group location changes in the Domain Explorer tree
- Domain Explorer group operations (add, delete, or modify a group)
- Changes in the Domain Explorer properties of an NE
- NE Service, PM Service, and Cisco MGM GateWay Service start or stop operations
- Cisco MGM user administration (add, delete, or modify user profile)
- Changes in:
  - UI properties
  - Security settings
  - High availability settings
  - Recovery settings
  - Database configuration
  - Error log configuration
  - NE autobackup parameters
  - NE service parameters
- Job or task cancellation in the Job Monitor table
- Manual memory backup
- Memory restore
- Software download
- OSS profile changes (CORBA)
- Cisco MGM GateWay/CORBA client logins/logouts

The following topics are covered:

- 8.4.1 Viewing the Audit Log
- 8.4.2 Filtering Audit Log Data

8.4.1 Viewing the Audit Log

To view the Audit Log, choose **Administration** > **Audit Log** in the Domain Explorer window. Table 8-19 describes the fields in the Audit Log.

Table 8-19 Field Descriptions for the Audit Log

Field	Description
Source ID	Source of the event. Events performed by the Cisco MGM server show *Cisco MGM* as the source ID.
Username	Name of the user performing the logged event. Events performed by the Cisco MGM server are logged under the username *Internal*.
Service	Name of the service that generated the audit log entry.
Cisco MGM Time Stamp (*time zone*)	Date and time when the event occurred on the Cisco MGM server.
Category	Name of the category in which the event occurred. Events belong to one of the following categories: Cisco MGM server administration, Cisco MGM server connectivity, Cisco MGM server security, Cisco MGM server topology, Cisco MGM server network, or NE provisioning.
Message	Description of the significant event that occurred.

8.4.2 Filtering Audit Log Data

Use the Audit Log Filter dialog box to filter data according to criteria that you select and to display the results in the Audit Log table. To access the Audit Log Filter dialog box, in the Cisco MGM Audit Log window, choose **File** > **Filter**. Table 8-20 describes the fields in the filter dialog box.

Table 8-20 Field Descriptions for the Audit Log Filter Dialog Box

Tab	Description
Time Stamp (*time zone*)	Filter audit log data for a specified time period, ranging from the past hour to the past 6 months. You can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be GMT, a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. If you want to filter audit log data and the time period is not important, click **No Time Specified**.
Source ID	Move NEs back and forth between the list of available NEs and selected NEs and then run the filter.
Category	Filter audit log data by task.
Username	Move users back and forth between the list of available users and selected users and then run the filter. Events performed by the Cisco MGM server are logged under the username *Internal*.
Service	Move services back and forth between the list of available services and selected services and then run the filter.

Managing Faults

This chapter describes the process of fault management, and details the options available in Cisco MGM to locate, diagnose and correct network problems. This chapter includes the following information:

- 9.1 What Is Fault Management?
- 9.2 Where Can I Get Information on Affected Services and Customers?
- 9.3 What Fault Information Can I See?
- 9.4 Is the Service Working?
- 9.5 Where Is the Fault?
- 9.6 How Can I Use Advanced Debugging to Find the Cause of the Fault?
- 9.7 What Is the Fault Priority?
- 9.8 Who Is Responsible for Managing the Fault?
- 9.9 How Did You Manage the Fault?

9.1 What Is Fault Management?

Fault management (FM) is the process of locating, diagnosing, and correcting network problems. This is important for increasing network reliability and effectiveness, and for increasing the productivity of network users. Fault management is more than just handling emergencies. It is the detection, isolation, and correction of abnormal conditions in the network and its environment. It provides functions for managing problems with services and handling customer-facing service problems.

Efficient fault management can:

- Reduce repair costs through efficient fault detection, location, and correction.
- Improve customer care through efficient trouble administration.
- Improve service availability and equipment reliability through proactive maintenance and through measurement, review, and corrective action.

One responsibility of fault management is to detect faults. A piece of equipment, a transmission medium, a software module, or a database is said to be in a fault state if it cannot perform its intended function and meet all of the requirements placed on that function. The onset of a fault is called a *failure event* and is usually signaled by one or more alarm reports. The termination of a fault state is called a *clear event.*

Fault management is responsible for determining, from a variety of information sources, the root cause of a fault, and for its repair. In certain cases, the root cause of a fault may be in a connecting network. In such cases, fault management is responsible for reporting the problem through appropriate channels.

Service assurance is the overall process of ensuring that the purchased level of service is delivered. The Element Management System (EMS) plays a key role in maintaining the health of both network elements and transmission facilities. This is done in conjunction with other systems, typically at the network management layer and service management layer. The EMS can be the primary repository of detailed history of NE-specific faults and events, technician action, and performance data.

The steps for successful fault management are:

1. Identify a problem by gathering data about the state of the network (polling and trap generation).
2. Restore any services that have been lost.
3. Isolate the cause, and decide if the fault should be managed.
4. Correct the fault if possible.

9.1.1 What the NE Provides

NEs can provide the following information that is required for effective fault management:

Currently deployed, intelligent NEs provide the management system with the following, which are required for effective fault management:

- Detection of the four main types of failure:
  - Equipment failure—Detected through failure detection mechanisms built into the hardware, and through routine exercises and diagnostics.
  - Software failure—Detected through failure of software checks, and through routine audits.
  - Communications failure—Detected through defects in the incoming signal or communicated from the distant end of a trail in an embedded operations channel by the signal processing chip sets, and through continuous or periodic measurements of incoming and outgoing signal characteristics. Defects include line coding errors, framing bit errors, parity errors, cyclic redundancy check errors, and addressing errors. Signal characteristics include, optical or electrical power, analog signal to noise ratio, and deviation from required voltage or wavelength.
  - Environmental failure—Defects could include power faults such as overheating.
- Notification of failure—NEs notify Cisco MGM when a failure occurs by generating an alarm report. The NE can also report a summary of current fault states, or replay its log of historical failures and clears.
- Notification of changes in the operational state of the NE's components—If a component of the NE is in the fault state, then Cisco MGM should not receive (or expect to receive) further alarms, alerts, or scheduled performance data from that component if the alarm is not cleared.

Cisco MGM forwards information northbound and integrates with other third party management systems to give options not directly available in Cisco MGM.

9.1.2 Fault Notification and Maintenance

Fault notification and maintenance can be proactive or reactive:

- Proactive notification—Where X notifies Y of a problem regarding a service delivered from X to Y.
- Reactive maintenance—Where Y contacts X to query X on potential problems in X’s domain.

9.1.2.1 Proactive Maintenance

Automated detection tests and surveillance software enable rapid initiation of the repair process, sometimes even before customers have noticed a problem. This is called proactive maintenance and promotes customer satisfaction.

Proactive maintenance consists of functions and processes associated with the detection, analysis, isolation, and resolution of problems by means that are independent of customer trouble reports. The problems may be faults or degradations in equipment or transmission media.

The goals of proactive maintenance are to:

- Detect and fix service quality problems before the customer calls to establish a trouble report (ideally), or at least to start the repair process before the customer calls, thereby minimizing the time, as perceived by the customer, before service is restored.
- Maintain the transport network at a high level of quality by identifying the facilities that perform relatively poorly and rehabilitating them.

9.1.2.2 Reactive Maintenance

Reactive maintenance is required when a failure occurs. This type of problem can be time-consuming and costly. It requires accurate administration of trouble reports, rapid analysis and repair of service affecting faults, and notifications to customers of restoration of service, all of which also promote customer satisfaction.

9.1.3 Root Cause Analysis

The *root cause* is the most basic reason for an undesirable condition or problem that, if eliminated or corrected, would have prevented the problem from existing or occurring. The outcome of the root cause analysis is not a restatement of the most obvious symptom, but is the result of a methodical analysis of the problem situation, leading to the most basic cause.

Root cause analysis captures additional information about defects for the purpose of identifying preventive actions.

Cisco MGM includes advanced debugging features which capture additional information about defects.

9.2 Where Can I Get Information on Affected Services and Customers?

The first thing to do in fault management is to identify what services and which customers are affected by the fault. Cisco MGM provides a number of options for viewing this information, including:

- 9.2.1 Dashboard
- 9.2.2 Tooltips
- 9.2.3 Domain Explorer
- 9.2.4 Alarm Browser
- 9.2.5 Network Map
- 9.2.6 Diagnostic Center

Then you need to identify the alarms:

- 9.3.1 How Are Alarms Displayed?

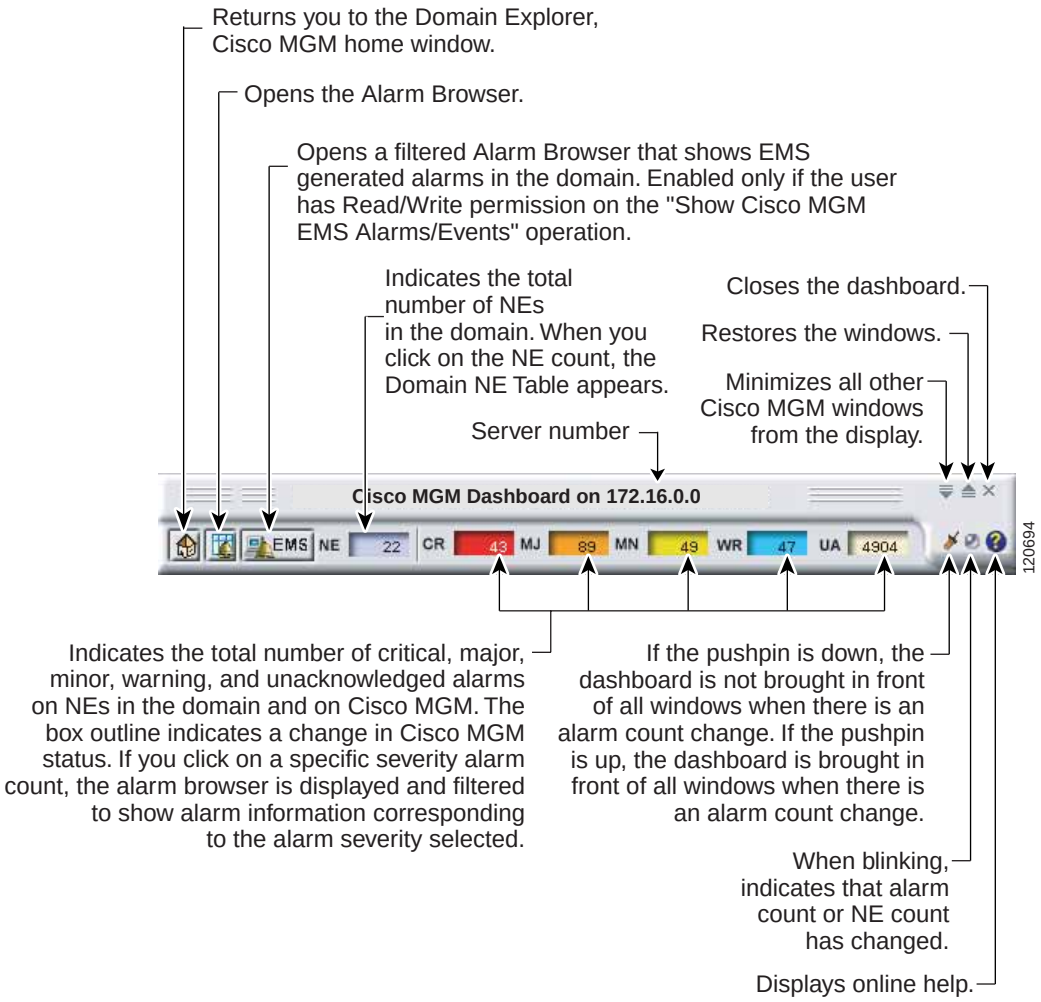
When a module is under maintenance, you can suppress the alarms so that they are not displayed on the Cisco MGX Alarm or History tab or on any other client:

- 9.3.2 Suppressing Alarms

9.2.1 Dashboard

The Dashboard shows useful alarm and NE information in one easily accessible location. See Figure 9-1.

Figure 9-1 Dashboard



Note If you click an alarm count box in the Dashboard, the Alarm Browser appears (see Figure 9-3), prefiltered for the selected alarm severity.

If there is a change in the alarm count, and the pushpin is up, the Dashboard is moved to the front of the other windows.

9.2.2 Tooltips

A tooltip appears with the actual alarm counters when the cursor is positioned over a managed object (domain, group, NE, or board). The tooltip displays a count for each of the following severities:

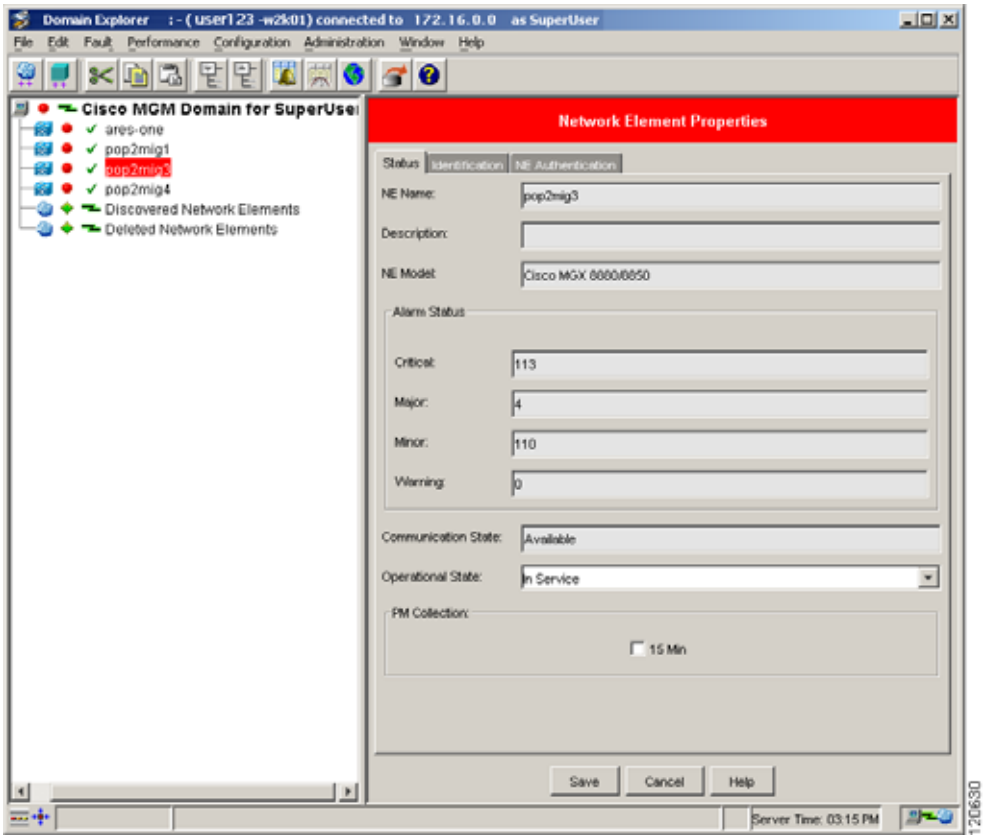
- CR—Critical
- MJ—Major
- MN—Minor
- WR—Warning
- UA—Total number of alarms unacknowledged

9.2.3 Domain Explorer

The Domain Explorer is the home window and provides a logical view of the network plus alarm, connectivity, and operational status. (See Figure 9-2.) It is divided into two sections:

- Hierarchy pane—Consists of the different components, which appear in a hierarchical format. The top level of the hierarchy is the management domain, followed by groups, and then NEs. Groups and NEs may be repositioned in the hierarchy using either cut/paste or drag and drop operation. Groups and NEs can exist in multiple locations in the tree.
- Property sheet—Displays information about the component selected in the Hierarchy pane. There are three property sheets: Management Domain Properties, Group Properties, and Network Element Properties.

Figure 9-2 Domain Explorer



SuperUsers or Network Administrators use the Domain Explorer to create groups of NEs and to organize the domain in a hierarchy. By default, the Domain Explorer contains the following groups that are visible to SuperUsers and Network Administrators only:

- Discovered NEs—Contains NEs that have been automatically discovered by the server. Discovered NEs are added to the Discovered NEs group by default and then managed automatically. Refer to the "4.2.4 Network Element Discovery" section on page 4-7 for more information on discovery service.
- Deleted NEs—Contains NEs that have been deleted. An NE appears in this group only when the last instance of that NE has been deleted.
- Lost and Found—The client performs a minimal check at initialization to verify that the tree representation for the administrator's domain is valid. If there are any mismatches between the groups and NEs in the domain and those in the administrator's domain, the mismatched NEs or groups are shown in the Lost and Found group in the Domain Explorer Hierarchy pane. If the administrator moves the NEs or groups in the Lost and Found group to another group and then clicks **Refresh Data** or restarts the client, the Lost and Found group disappears.

Note The Discovered NEs, Deleted NEs, or Lost and Found groups may not be deleted or renamed.

Note The server time is displayed on the lower right side of the Domain Explorer.

Note Clicking **Refresh Data** in the Domain Explorer window refreshes all data for the entire client and closes all open windows (except the Domain Explorer window). Depending on the number of NEs in the network, there might be some delay while the data refreshes. The status bar shows the status after the Domain Explorer refreshes. It will show "Refresh Data Complete."

The Fault menu and associated toolbar tools are listed next to their corresponding menu options in A.3.3 Fault Menu.

9.2.4 Alarm Browser

The Alarm Browser displays standing alarms and conditions in the managed domain that are assigned a severity level of critical, major, minor, or warning. It also shows cleared alarms that are not acknowledged. See Figure 9-3. The Alarm Browser and Alarm Log views provide a robust listing of all current and historical alarms and events. See the "9.9.1 Archiving Alarm Log" section on page 9-50 for more information about the Alarm Log.

To display the Alarm Browser, select an NE, group, or domain node from the Domain Explorer, or Network Map; then, choose **Fault > Alarm Browser** (or click the Open Alarm Browser tool from the Dashboard). Use the toolbar buttons to manage the alarm display. These buttons are described in "A.3.1 File Menu" section on page A-7.

Figure 9-3 Alarm Browser

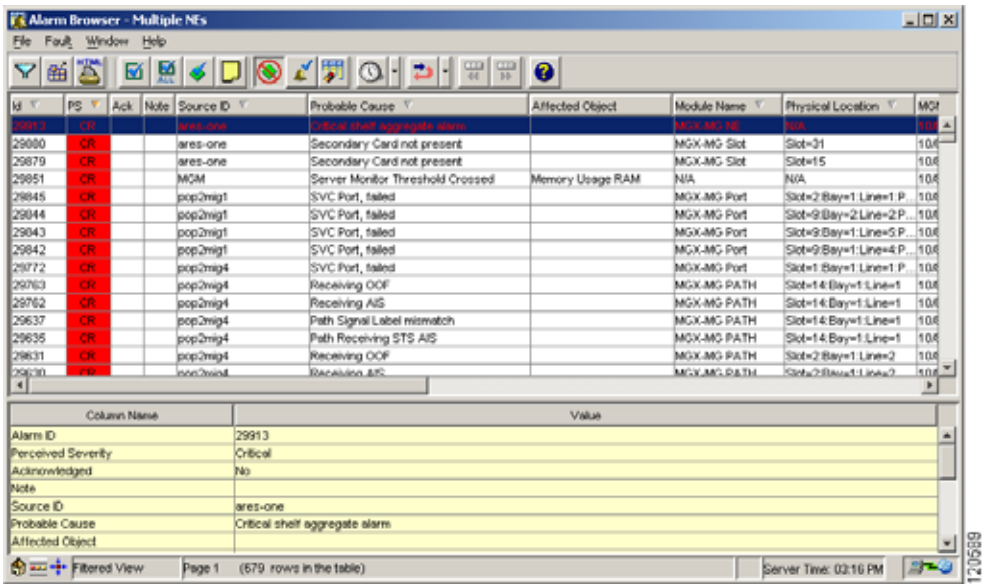


Table 9-1 provides descriptions of the fields in the Alarm Browser.

Table 9-1 Field Descriptions for the Alarm Browser Window

Column Name	Description
Alarm ID	Indicates the unique number that the system uses to identify a particular alarm.
Perceived Severity	Displays the perceived severity of the selected alarm (critical, major, minor, or warning). The background color also indicates the severity, where: • Red = Critical • Orange = Major • Yellow = Minor • Cyan (blue-green) = Warning • Green = Cleared
Acknowledged	Indicates whether the selected alarm has been acknowledged by the user. Values are Yes and No.
Note	Displays any notes that were entered for the selected alarm. This field also shows the login name of the user who entered the note and the time when the note was entered.
Source ID	Displays the name of the network element where the selected alarm occurred.
Probable Cause	Displays the probable cause of the selected alarm. Displays Not Applicable/Unknown if no additional information is available.
Affected Object	Displays the name of the object where the selected alarm occurred.
Module Name	Displays the name of the module where the selected alarm occurred.
Physical Location	Displays the physical location of the equipment where the selected alarm occurred, such as slot, and port numbers.
Alarm Time Stamp	Displays the date and time when the alarm occurred on the server.
NE Alarm Time Stamp	Displays the date and time when the alarm occurred on the NE.
Service Affecting	Indicates whether the alarm condition is service affecting (SA); values are Yes and No.
Clear Time Stamp	Displays the date and time when the alarm was cleared on the server.
NE Clear Time Stamp	Displays the date and time when the alarm was cleared on the NE.
Acknowledged Time Stamp	Displays the date and time when the user acknowledged the selected alarm.
Acknowledged Username	Displays the login name of the user who acknowledged the selected alarm.
Alarm Status	Displays the status of the selected alarm (active or cleared).
Description	Displays additional information about the selected alarm. If there is no additional information, this field is blank.

9.2.5 Network Map

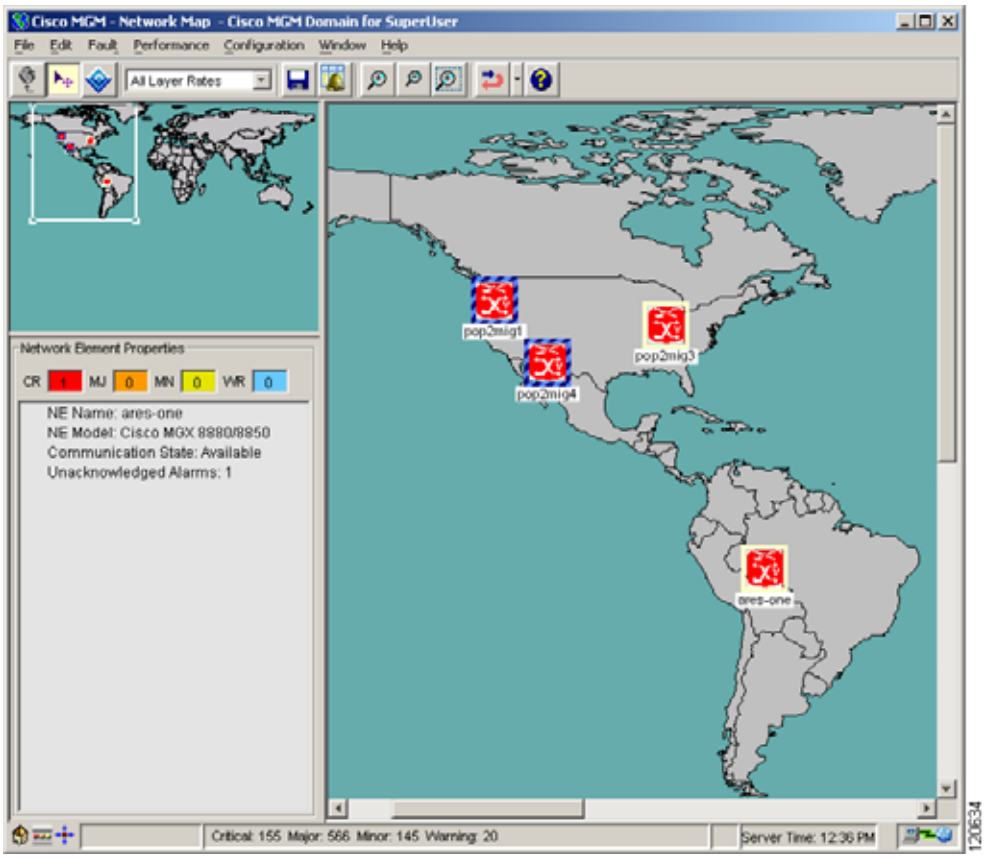
The Network Map window displays a geographical layout of the network. (See Figure 9-4.) It consists of three areas:

- The right side displays a map with the individual groups and NEs icons.
- The upper left side displays the position of the map on the right side with respect to a larger world map.
- The lower left side displays the NE, or group properties, including the number of alarms and ID.

A Network Map window can be opened for an NE, group, or the domain. Select a node in the Domain Explorer Hierarchy pane and choose **File > Network Map** (or click the **Open Network Map** tool).

The Network Map is organized into a multilevel hierarchy that corresponds to the structure of the Domain Explorer when launched from the respective window. The Network Map hierarchy consists of management domains, groups, and NEs, that are represented by icons plotted automatically in a map. Zooming capabilities are provided and the node positions, node icons, and background map images can be customized.

Figure 9-4 Network Map



9.2.6 Diagnostic Center

The Diagnostic Center provides a hierarchical representation of network elements, which include networks, nodes, cards, lines and ports displayed in tree format in the Hierarchy pane of the Diagnostic Center's main window. Associated information about a selected network element is displayed in table format in the right panel of the Diagnostic Center window (See Figure 9-5).

Each network element managed by Cisco MGM has its own attributes and fits into the network's physical or logical hierarchy. The Diagnostic Center presents the network elements that are discovered, managed, and controlled in a hierarchical view for all networks populated in the tables by Cisco MGM processes.

The Diagnostic Center displays the network elements in a hierarchical format based on either a physical or logical relationship among the various network elements. Networks are displayed at the root level of the component tree; nodes are displayed beneath the networks in a parent/child relationship.

The Diagnostic Center also displays informational messages in a multiline text display; other types of messages can be displayed in response to user actions.

The Diagnostic Center can be opened for an NE, group, or the domain. Select a node in the Domain Explorer Hierarchy pane and choose **Fault > MGX8880/8850 MG > Diagnostic Center**.

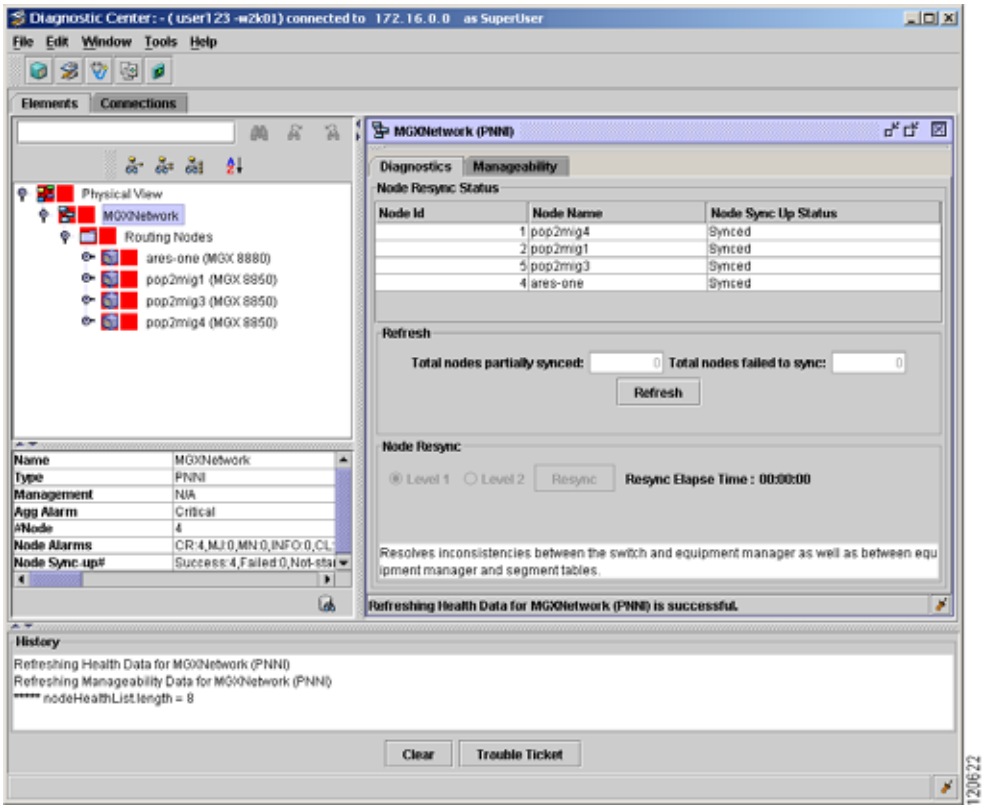
The Diagnostic Center has two access tabs:

- Diagnostic—Displays the diagnostic status and test results for the network elements.
- Manageability—Monitors the statistics events for network manageability

The Diagnostic Center allows users to:

- Diagnose network elements, for example, networks, nodes, cards, lines, ports, or paths. By diagnosing network elements, you can:
  - Monitor real-time counters.
  - Extend support for the Node Resync process to allow for two different levels.
  - Configure bit error rate test (BERT) to verify the integrity of a network element by measuring error statistics.
- Monitor statistic events for network manageability to collect element management health-related statistics. In addition, you can:
  - Verify that all the nodes in the network are managed correctly by Cisco MGM.
  - Identify general network problems.
  - Provide success rates, failure rates, and throughput of Cisco MGM to protocols such as FTP, and SNMP.
  - Create a trouble ticket that extracts all the information from the History Panel.
- Diagnose connections to:
  - Access fault management capabilities in the form of diagnostic tests for connections, which include continuity (integrity) facility for PNNI soft permanent virtual connection (SPVC).
  - Perform general test operations such as up and down connections, and connection loopback.

Figure 9-5 Diagnostic Center



9.3 What Fault Information Can I See?

An alarm is represented by a notification from a managed NE that a certain condition has just occurred. These alarms usually represent error conditions on NEs. Each alarm is associated with the NE for which it provides notification, and an NE can have a number of alarms related to itself at any time.

Each NE shown in the Domain Explorer Hierarchy pane has a corresponding alarm icon that indicates the highest severity alarm that affects the NE. Management domain nodes and group nodes have alarm icons that reflect the highest alarm condition of the NEs contained in the domain or group.

The user-defined Domain Explorer Network views have “bubble-up” alarm severity propagation and drill-down capabilities to isolate fault conditions and to identify service-delivery impact.

In Cisco MGM you can see:

- 9.3.1 How Are Alarms Displayed?

There are occasions when it is useful to control the alarm display:

- 9.3.2 Suppressing Alarms

9.3.1 How Are Alarms Displayed?

Each node displays an icon, which uses an industry-standard color scheme that indicates the current alarm status. The multicolor displays are updated in real-time in response to events occurring in the network. Icons representing network nodes change color dynamically to reflect the status of the node, which allows rapid recognition of network faults as they occur.

In the Diagnostic Center, Configuration Center, Chassis View, and Statistics Report, you can display the color legend for alarms, choose **Help > Color Legend**.

Table 9-2 lists the color legend for alarms.

Table 9-2 Color Legend for Alarms for Diagnostic Center, Configuration Center, Chassis View, and Statistics Report

Color	Alarm State
Green	Clear
Yellow	Minor
Orange	Major
Red	Critical
Grey	Unmanaged
Blue	Unknown
Purple	LineHasLoopback

You can set the Alarm Browser or Alarm Log to display full background color for the entire selected row. The color corresponds to the alarm status and severity. In the Domain Explorer window, choose **Edit > User Preferences**. The User Preferences dialog box appears. On the FM Preferences tab, check the **Color Entire Row in Table View** check box.

In the Dashboard, Map Viewer, Alarm Browser, and the Domain Explorer, the color of the border surrounding a component, or the background color, indicates the operational status of the component. When status changes, the border or the background color changes as indicated in Table 9-3.

Table 9-3 Dashboard, Map Viewer, Alarm Browser, and Domain Explorer Alarm Severity Color Descriptions

Color	Severity	Meaning	Description
Green	Cleared	Component is active.	The component is operating normally.
Yellow	Minor	Minor failure.	The component is down; both administrative and operational values are down. This does not necessarily indicate a fault condition; the component might be disabled.
Orange	Major	Component is down.	Administrative status is up and operational value is down.
Red	Critical	Component failed.	Physical hardware failure.
Cyan (blue-green)	Warning	Interface is dormant.	The interface cannot pass packets, but is in a pending state waiting for some external event to place it in the up state. The interface might have packets to transmit before establishing a connection to a remote system, or a remote system might be establishing a connection to the interface. When the pending event occurs, the interface changes to the up state.

9.3.2 Suppressing Alarms

Suppressing alarms prevents alarms from appearing on the Cisco MGX Alarm or History tab or on any other clients. Alarms are suppressed when the NE is under maintenance. See 5.3.1 Changing the Operational State of an NE.

9.4 Is the Service Working?

Network devices will report symptoms of problems by generating events. An event in this context is a message indicating that a device or application in your network has discovered something of note. The network devices will generate many types of events automatically.

In addition, you can use thresholds to define or modify the conditions under which events are generated. A *threshold* is a trigger, set up on a continuous data stream, that is a point of interest that generates events when that point is satisfied.

The events generated need to be analyzed to determine whether they represent a fault condition or problem in your network.

It is important to generate events when there is a problem in the EMS. It is also important to limit the number of events generated to prevent an excessive load on the network. The EMS performs a number of self-monitoring tasks where threshold limits can be set. The threshold limits are set in the Self Monitor Table. If one of these thresholds is crossed, then an EMS alarm will be generated.

The user can obtain information regarding how the system is performing and how long certain tasks are taking to complete by selecting **Administration > Control Panel** then **Alarm Configuration > Threshold EMS Alarms** or **Alarm Configuration > Non-Threshold EMS Alarms**. (See 9.4.3 Setting Up and Viewing Alarm Configuration Parameters.) By monitoring this data, you can identify potential system problems before they become critical in the operation of the EMS. Associated with each parameter that is monitored are three alarm thresholds. The administrator can set a minor, major, and critical threshold value for each parameter. If any of these thresholds are crossed, then an alarm will be raised to provide notification of the situation.

Threshold alarms are raised when their limit exceeds the value set for Critical, Major, Minor, or Warning thresholds. For example, you can set threshold alarms for disk usage for 90%, 80%, 70%, and 60%, meaning a warning alarm is raised when the disk becomes 61% full and a critical alarm is raised when the disk becomes 91% full. The server checks these parameters at every polling interval that is set in the Poll Frequency field.

Non-threshold alarms do not have an alarm threshold. Instead, non-threshold alarms occur when a condition occurs, such as loss of connectivity to an NE. Use the Non-Threshold EMS Alarms tab to set the severity level (critical, major, minor, or warning) for which a non-threshold alarm should be raised when that condition occurs.

Caution Changing the EMS alarm severities can affect the alarm status seen by listeners on the EMS's OSS interfaces.

The following sections provide information on network elements:

- 9.4.1 Viewing Service Status
- 9.4.2 Viewing Alarms
- 9.4.3 Setting Up and Viewing Alarm Configuration Parameters

These tasks are used to diagnose network elements with the Diagnostic Center:

- 9.4.4 Displaying the Status of all Nodes in the Network
- 9.4.5 Displaying the Status of a Node
- 9.4.6 Displaying the Status of a Card
- 9.4.7 Displaying the Status for Lines or Ports
- 9.4.8 Displaying the Status for Paths in a Loopback for the VXSM-OC3 Card
- 9.4.9 Displaying the Status for Lines in a Loopback

These tasks are used to diagnose the voice cards for both Voice Service Module (VXSM) and Voice Interworking Service Module (VISM-PR):

- 9.4.10 Displaying the Paths in Loopback for the VXSM-OC3 Card
- 9.4.11 Displaying the Status for a Bit Error Rate Test for the Voice Cards
- 9.4.12 Displaying the Lines in Loopback for the Voice Cards
- 9.4.13 Managing the Status for the VXSM Features
- 9.4.14 Managing the Status for the VISM-PR Features

This task is used to diagnose connections:

- 9.4.15 Diagnosing Connections

These tasks describe the Bit Error Rate Test (BERT) used to verify the integrity of a network element:

- 9.4.16 Bit Error Rate Test
- 9.4.17 Configuring Bit Error Rate Test
- 9.4.18 Displaying Bit Error Rate Test

9.4.1 Viewing Service Status

You can monitor the different services that run on the server. To view service status, choose **Administration > Service Monitor** in the Domain Explorer window. The Service Monitor Table appears and displays the status of the services that are currently running on the server. The table displays the following information:

- Service Name—Name of the service
- Logged In At—Time that the user last logged in
- IP Address—IP address of the service
- Session ID—Unique session ID

Note The **showmgm** command from the CLI is an alternate way of viewing processes or services that are currently running on the server.

9.4.2 Viewing Alarms

The Alarm Browser has a specific selection context, which means that it displays alarm information that corresponds to the view where it was launched. If you launch the Alarm Browser from the management domain node, the browser shows all NE alarms, and all EMS alarms (if you have permission to see EMS alarms). If you launch the Alarm Browser from a group, or NE node, the browser shows only NE alarms for that group, or NE node. If you launch the Alarm Browser from the Dashboard, the browser shows all NE alarms for the domain.

The Alarm Log window shows alarms that have transitioned from the Alarm Browser. Cleared alarms are transitioned when you acknowledge them or when automatic acknowledgment has been enabled. In addition, the Alarm Log shows a history of cleared and acknowledged alarms and all transient conditions (also known as events or autonomous nonalarmed messages).

You can locate the equipment for an existing alarm in the Domain Explorer, choose **Fault > Alarm Browser** or **Fault > Alarm Log** (or click the Open Alarm Browser or Open Alarm Log tool).

9.4.3 Setting Up and Viewing Alarm Configuration Parameters

The Alarm Configuration property sheet allows you to configure alarm severities for system parameters. The Self Monitor Table displays information about threshold parameters. These parameters are collected and evaluated based on the NE model types. To set up and view alarm configuration parameters:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Click **Alarm Configuration** to open the Alarm Configuration property sheet. The Threshold EMS Alarms tab displays the information detailed in Table 9-4:

Table 9-4 Alarm Configuration—Threshold EMS Alarms Tab

Field	Description
Poll Frequency	Displays the polling interval, in minutes, at which the Cisco MGM server checks parameters.
Parameter Name	This column displays the name of the parameter as follows: • CPU Usage (%): Percentage of CPU time utilized for executing user, system, and I/O tasks. • Config Resynch Time (seconds): Time it takes for Cisco MGM to collect alarm and inventory information from the NE. • Disk Usage (%): Percentage of disk space used in a particular partition. Cisco MGM database and partitions are monitored separately. • Memory Usage RAM (%): Percentage of RAM memory used for all processes of the system. • Memory Usage SWAP (%): Percentage of SWAP memory used for all processes of the system. • NE Synch Time (seconds): Time it takes to synchronize Cisco MGM server with the NEs. • PM Collection Time (seconds): Time it takes to collect PM data for an NE. It is the sum of the time it takes to read the PM data and the time it takes to update the database. • Prune Time Audit Log (seconds): Time it takes to prune audit log data. • Prune Time Audit Trail Log (seconds): Time it takes to prune audit trail log data. • Prune Time Error Log (seconds): Time it takes to prune Error Log data. • Prune Time FM (seconds): Time it takes to prune FM data. • Prune Time Job Monitor (seconds): Time it takes to prune job monitor data. • Prune Time PM (seconds): Time it takes to prune PM data. • Prune Time Purge NE (seconds): Time it takes to prune NE purge data. • Prune Time Server Monitor (seconds): Time it takes to prune server monitor data.
Enable	This column displays whether or not the corresponding parameter in the Parameter Name column is enabled (checked) or disabled (unchecked). When checked, it enables monitoring for the selected parameter. If an EMS threshold alarm is outstanding when you disable monitoring, the EMS clears the alarm.
Critical	This column displays the amount of time, in minutes, that must elapse before triggering a critical alarm.
Major	This column displays the amount of time, in minutes, that must elapse before triggering a major alarm.
Minor	This column displays the amount of time, in minutes, that must elapse before triggering a minor alarm.

Note If an alarm is outstanding when you disable it, the system clears the alarm.

Step 2 In the **Non-Threshold EMS Alarms** tab, you can select the severity level that will be assigned to the non-threshold alarm parameter. See Table 9-5 for details.

Table 9-5 Alarm Configuration—Non-Threshold EMS Alarm Tab

Field	Description
Parameter Name	The Parameter Name column displays the following parameters: • Loss of Communication • Memory Auto or Manual Backup Failure • Maximum Login Attempts Exceeded • Alarm Resync Unsuccessful • Cisco MGM failed authentication by NE • A critical process is hanging, Cisco MGM will shut down in 5 minutes • Communication through Secondary IP Address • Sync-Up has not Started yet • Currently in Sync-Up • Partial Sync-Up • Sync-Up Failed • Server in Partial Sync-Up • Server Sync-Up Failed • FTP Transfer failure • FTP file size mismatch • FTP transfer failed • Upload File Error • Minus 2 Trap • Card Lost Trap • SNMP Retry exceeded • FTP Retry exceeded

Table 9-5 Alarm Configuration—Non-Threshold EMS Alarm Tab (continued)

Field	Description
Parameter Name (continued)	• Sync-up Failed • Stats File Error • Stats File Transfer Error • SNMP Throttle Error • Backoff failed • SNMP timeout • FTP Session timeout • FTP Transfer timeout • Unknown Error • Initialization Error • Configuration Error • Communication Error in ILOG • Communication Error in shared memory • Communication Error in CORBA • NTS Registration failed • NTS Trap loss • DataBroker Sync-Up Complete • Process Restarted • PM Fail EMS Alarm • PM Lost EMS Alarm
Severity	Allows you to click in the appropriate cell and select the alarm severity level from the available options (Critical, Major, Minor, or Warning) for each of the corresponding parameters listed in the Parameter Name column. If an EMS alarm is outstanding when you change its severity, the outstanding EMS alarm's severity remains the same. The next time the alarm is raised, the severity changes to the new setting.

Step 3 Click **Save**.

9.4.4 Displaying the Status of all Nodes in the Network

To display the status of all nodes in the network:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the network to the right hand pane to display the diagnostics at the network level. By default, the **Diagnostics** tab is selected in the right hand pane.

Step 2 The status of the following attributes at the network level are displayed:

- Node ID
- Node Name
- Current sync status of all the nodes of the network
- All out-of-sync nodes in the network
- A total of partially synced and failed synced nodes

9.4.5 Displaying the Status of a Node

To display the status of a node:

Step 1 In Diagnostic Center, click the Elements tab, and double-click or drag the node to the right hand pane to display the diagnostics at the node level. By default, **Diagnostics** tab is selected in the right hand pane.

Step 2 Verify the status of the following attributes at the node level:

- Current sync status of the node
- All out-of-sync cards in the node
- Node level statistics if applicable

9.4.6 Displaying the Status of a Card

Depending on the type of card, you can perform one or all of the functions from the following tabs:

- Paths in Loopback—Displays the paths in the loopback. (See 9.4.10 Displaying the Paths in Loopback for the VXSM-OC3 Card.)
- Lines in Loopback—Displays all lines that currently have loopback running. (See 9.4.12 Displaying the Lines in Loopback for the Voice Cards.)
- VXSM Features—Displays details of the Media Gateway Links, CIDs, RUDP Sessions, and XGCP MGC. (See 9.4.13 Managing the Status for the VXSM Features.)
- VISM-PR Features—Displays details of the XGCP Peers, SRCP Peers, and RUDP Sessions. (See 9.4.14 Managing the Status for the VISM-PR Features.)
- Running Berts—Display all lines that currently have a Bit Error Rate Test (BERT) running. (See 9.4.11 Displaying the Status for a Bit Error Rate Test for the Voice Cards.)

To display the status of a card:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level.

Step 2 Verify the status of the attributes at the card level.

Step 3 Click **Refresh** to update the Card Diagnostics window.

9.4.7 Displaying the Status for Lines or Ports

To display the status for lines or ports:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the line or port from the Hierarchy pane to the right hand pane to display the diagnostics at the line or port level. See Figure 9-6.

Depending upon the card type, you can also configure Bit Error Rate Test (BERT). For more information, see 9.4.17 Configuring Bit Error Rate Test.

You can also see if a line is in loopback. See 9.4.9 Displaying the Status for Lines in a Loopback.

Step 2 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 3 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 4 Verify the statistics name and statistics value.

Appendix E, "Real-Time Counters" gives details of the real-time counters displayed in the Diagnostic Center.

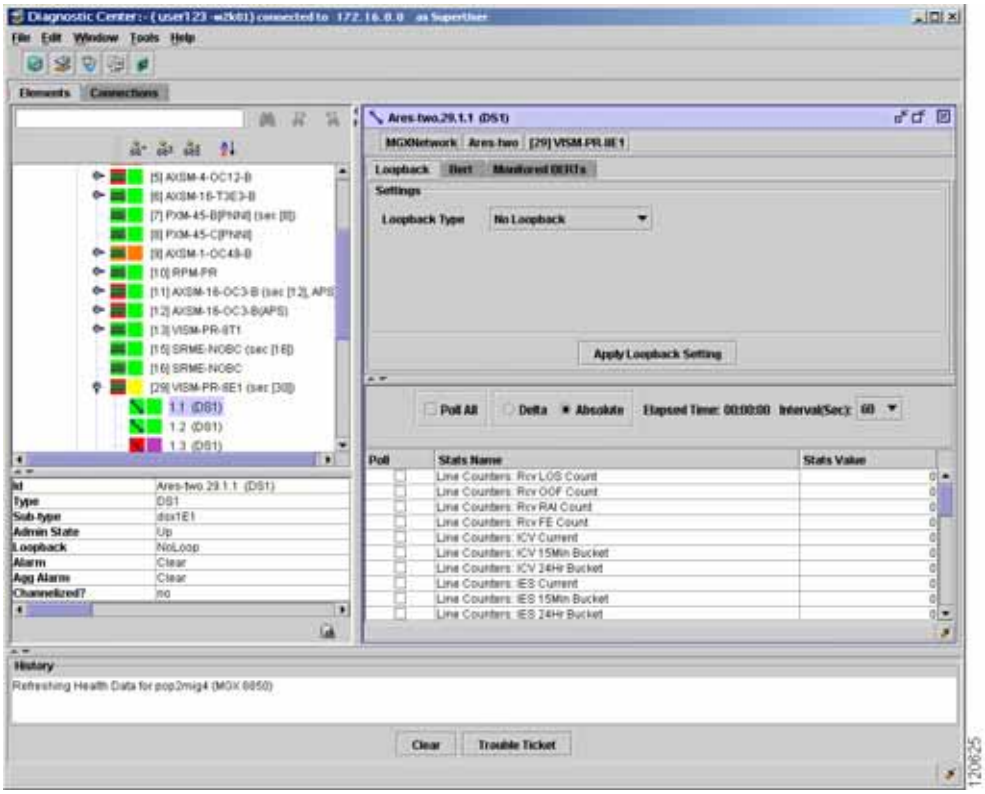
Appendix D, "Statistics Summary" gives details of the statistics that are collected from the Cisco MGX 8880 and Cisco MGX 8850.

Step 5 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Table 9-6 Diagnostic Center—Delta Mode and Absolute Mode Radio Buttons

Radio Button	Description
Delta Mode	Resets the counters and displays only the delta differences. Delta mode restarts the timer and takes the current values of the counters as base values, which are subtracted from the polled values for all the subsequent polls. The delta report is always the base values and the timer, which indicates the time lapsed since entering the delta mode. If you switch between delta to absolute mode, the timer is reset again.
Absolute Mode	(default) Provides the raw data shelved at the current counter state for the switch.

Figure 9-6 Diagnostic Center—Line Status



9.4.8 Displaying the Status for Paths in a Loopback for the VXSM-OC3 Card

To display the paths for a loopback for the VXSM-OC3 card:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the card from the Hierarchy pane to the right hand pane to display the diagnostics at the path level.

Step 2 Click the **Paths In Loopback** tab.

Step 3 Verify the following parameters for the path:

- Path Id
- Path Type
- Loopback Type

Step 4 Click **Refresh** to update the settings for the Path Diagnostics window.

9.4.9 Displaying the Status for Lines in a Loopback

To display the lines for a loopback:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the card from the Hierarchy pane to the right hand pane to display the line in the loopback.

Step 2 Click the **Lines In Loopback** tab.

Step 3 Verify the following parameters for the line:

- Line Number
- Loopback Type

Step 4 Click **Refresh** to update the settings for the Line Diagnostics window.

9.4.10 Displaying the Paths in Loopback for the VXSM-OC3 Card

To display the paths in loopback for the VXSM-OC3 card for both SONET and SDH lines:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM-OC3 card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level. See Figure 9-7.

Step 2 Click the **Paths In Loopback** tab.

Step 3 Verify the following parameters for the path:

- Path Id
- Path Type
- Loopback Type

Step 4 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

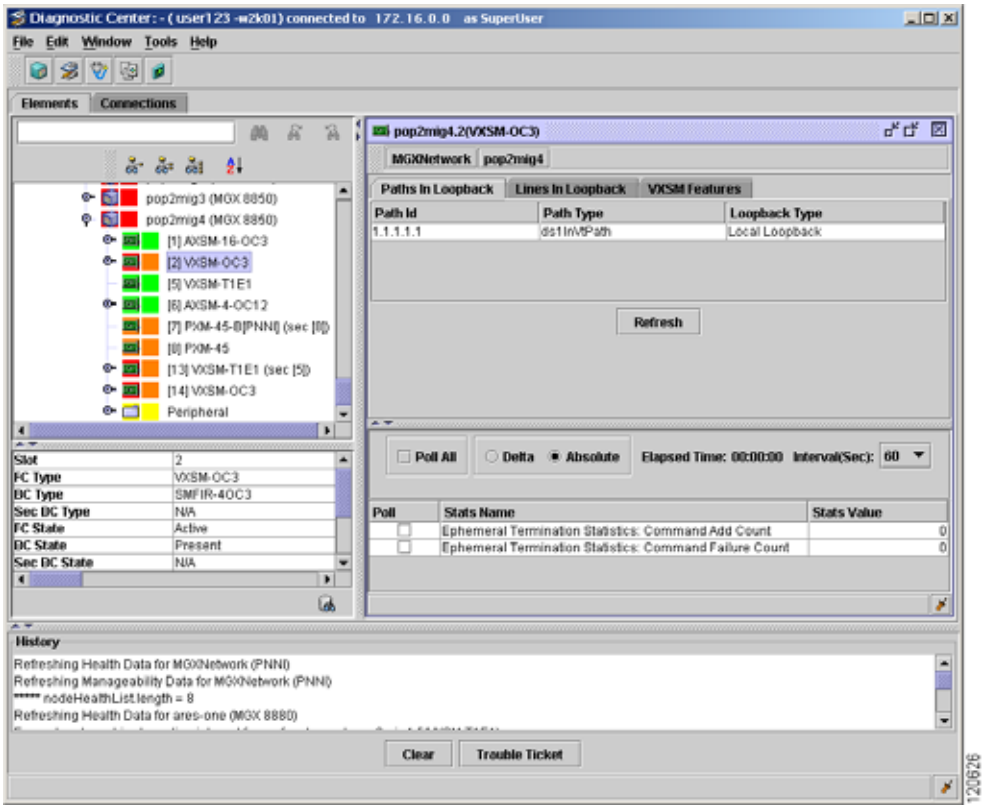
Step 5 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 6 Verify the statistics name and statistics value for the real-time counters.

Step 7 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 8 Click **Refresh** to update the settings for the paths in loopback for the VXSM-OC3 card for both SONET and SDH lines.

Figure 9-7 Diagnostic Center—Paths in Loopback



9.4.11 Displaying the Status for a Bit Error Rate Test for the Voice Cards

You can setup BERT options on the looped back connection and use the available test patterns displayed in the BERT Configuration window. See 9.4.17 Configuring Bit Error Rate Test

To display the status for a BERT for the VXSM card for a T1E1 line and VISM-PR cards:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM-48T1E1 card or VISM-PR card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level. See Figure 9-8.

Step 2 Click the **Running Berts** tab.

Step 3 Verify the following parameters for the BERT test:

- Entity Id
- Entity Type
- Operation Status
- Bits Received
- Bits Received (Wrap Count)
- Bits Received In Error
- Bits Received In Error (Wrap Count)

Step 4 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

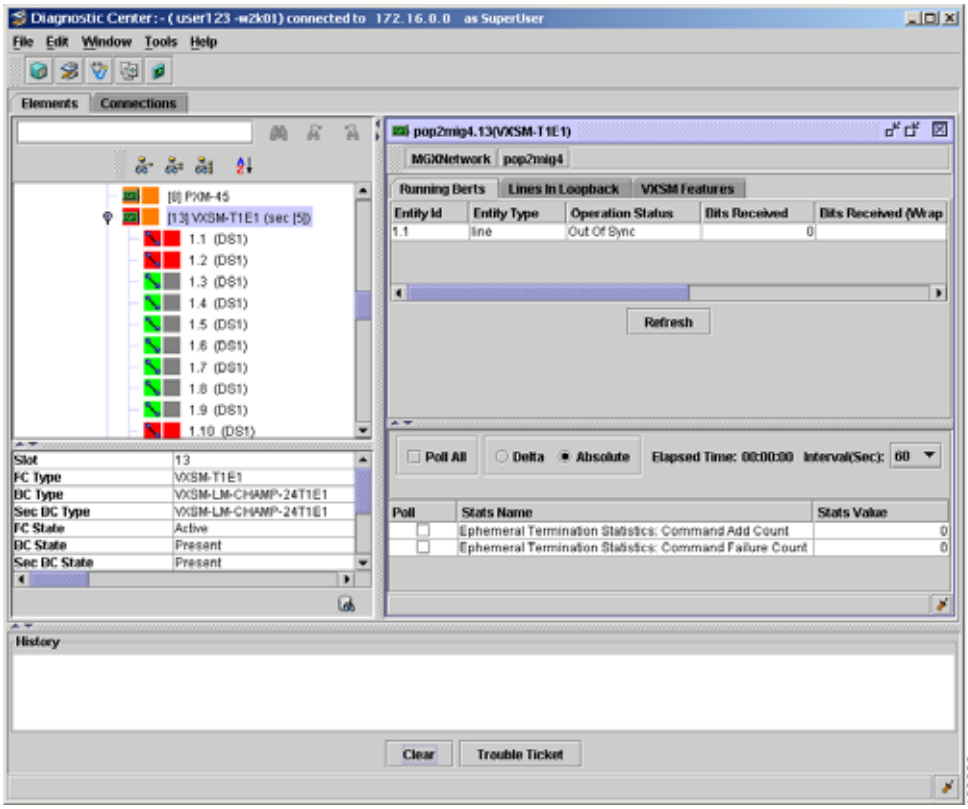
Step 5 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 6 Verify the statistics name and statistics value for the real-time counters.

Step 7 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 8 Click **Refresh** to update the settings for the lines in loopback for VXSM.

Figure 9-8 Diagnostic Center—Bit Error Rate Test



9.4.12 Displaying the Lines in Loopback for the Voice Cards

To display the lines in loopback for the VXSM card for both SONET and T1E1 lines and the VISM-PR cards:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM or VISM-PR card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level. See Figure 9-7.

Step 2 Click the **Lines In Loopback** tab.

Step 3 Verify the following parameters for the path:

- Line Number
- Loopback Type

Step 4 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 5 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 6 Verify the statistics name and statistics value for the real-time counters.

Step 7 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 8 Click **Refresh** to update the settings for the lines in loopback for VXSM.

9.4.13 Managing the Status for the VXSM Features

These tasks are used to manage the status for the VXSM features:

- 9.4.13.1 Displaying the Status for Media Gateway Links for the Voice Cards
- 9.4.13.2 Displaying the Status for Reliable User Datagram Protocol for the Voice Cards
- 9.4.13.3 Displaying the Status for Xternal Gateway Control Protocol for the Voice Cards

9.4.13.1 Displaying the Status for Media Gateway Links for the Voice Cards

Note A session of the type of object must be available before it can be polled.

To display the Media Gateway Links (MGL) for voice cards for both SONET and T1E1 lines:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level.

Step 2 Click the **VXSM Features** tab and choose **Media Gateway Links** from the drop-down box.

Step 3 Verify the following parameters for the path:

- Gateway Link ID
- Gateway IP Address
- Gateway Port
- Control Protocol
- Gateway Link Operational State

Step 4 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 5 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 6 Verify the statistics name and statistics value for the real-time counters.

Step 7 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 8 Click **Refresh** to update the settings for the Media Gateway Links for VXSM.

9.4.13.2 Displaying the Status for Reliable User Datagram Protocol for the Voice Cards

Note A session of the type of object must be available before it can be polled.

To display the Reliable User Datagram Protocol (RUDP) for VXSM card for both SONET and T1E1 lines:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level. See Figure 9-9.

Step 2 Click the **VXSM Features** tab and choose the **RUDP Sessions** option from the drop-down arrow.

Step 3 Verify the following RUDP session parameters:

- **RUDP Session Number**—Specifies the session group where the group belongs. One group has a maximum of four sessions. The range is from 1-64.
- **State**—Specifies the following RUDP session states:
  - **oos**—Out of Service. When an RUDP session is created, the session state is **oos**.
  - **Is**—In Service. The state is changes to **Is** after the VXSM sent a start message to the MGC. The message is sent after a channel is created between the VXSM and the MGC.
  - **unknown**
- **Local IP**—Specifies the IP address of the local VXSM.
- **Remote IP**—Specifies the IP address of the remote VXSM.

Step 4 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 5 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 6 Verify the statistics name and statistics value for the real-time counters.

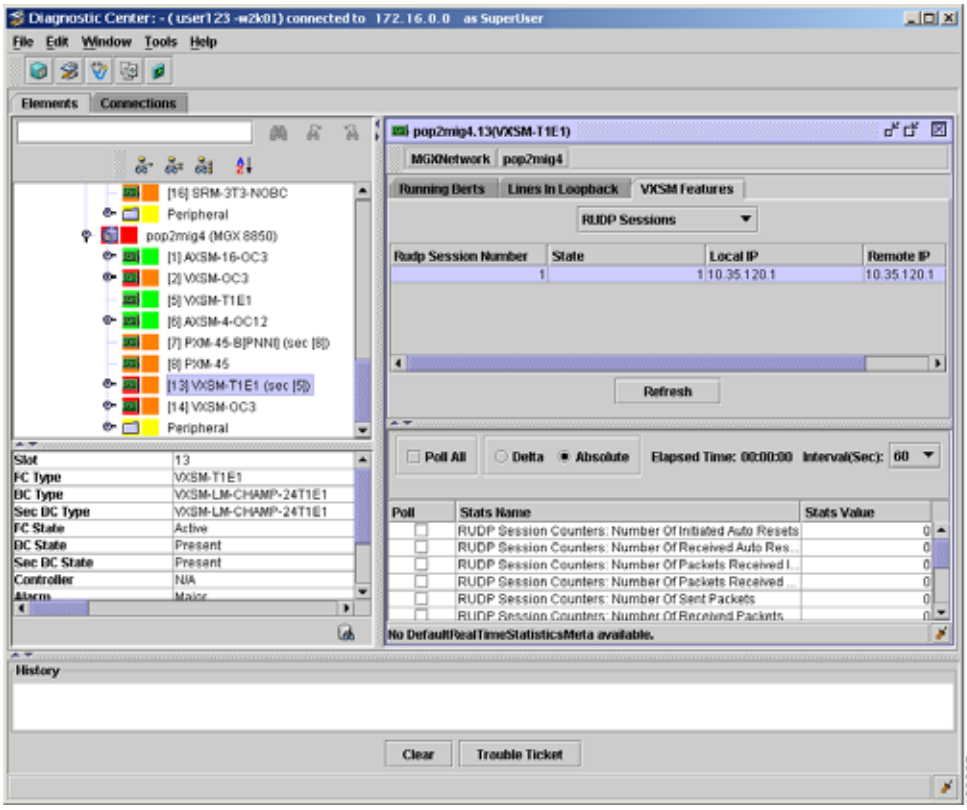
Step 7 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Appendix E, “Real-Time Counters” gives details of the real-time counters displayed in the Diagnostic Center.

Appendix D, “Statistics Summary” gives details of the statistics that are collected from the Cisco MGX 8880 and Cisco MGX 8850.

Step 8 Click **Refresh** to update the settings for the RUDP sessions for VXSM.

Figure 9-9 Diagnostic Center—Reliable User Datagram Protocol for Voice Card



9.4.13.3 Displaying the Status for Xternal Gateway Control Protocol for the Voice Cards

Note A session of the type of object must be available before it can be polled.

To display the Xternal Gateway Control Protocol (XGCP) for VXSM card for both SONET and T1E1 lines:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VXSM card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level. See Figure 9-9.

Step 2 Click the **VXSM Features** tab.

Step 3 Choose the **XGCP MGC** option from the drop-down arrow.

Step 4 Verify the following XGCP peer group parameters:

- **MGC Group Number**—Specifies the media gateway controller number. The range is from 1-8.
- **Gateway IP Address**—The Gateway IP Address Index parameter defines the media gateway address that relates to the PVC control type. The range is from 1-16.
- **Protocol Index**—Specifies the media gateway protocol number. The range is from 1-3.
- **Gateway UDP Port**—Specifies the Gateway User Datagram Protocol (UDP) port.

Step 5 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 6 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 7 Verify the statistics name and statistics value for the real-time counters.

Step 8 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Appendix E, "Real-Time Counters" gives details of the real-time counters displayed in the Diagnostic Center.

Appendix D, "Statistics Summary" gives details of the statistics that are collected from the Cisco MGX 8880 and Cisco MGX 8850.

Step 9 Click **Refresh** to update the settings for the XGCP peer group for VISM-PR.

9.4.14 Managing the Status for the VISM-PR Features

This task is used to manage the status for the VISM-PR features:

- 9.4.14.1 Displaying the Status for the Simple Resource Coordination Protocol Peers

9.4.14.1 Displaying the Status for the Simple Resource Coordination Protocol Peers

To display the status for the Simple Resource Coordination Protocol (SRCP) peer group for both VISM-PR cards:

Step 1 In the Diagnostic Center, click the Elements tab, and double-click or drag the VISM-PR card from the Hierarchy pane to the right hand pane to display the diagnostics at the card level.

Step 2 Click the **VISM Features** tab.

Step 3 Choose the **SRCP Peers** option from the drop-down arrow.

Step 4 Verify the following SRCP peer group parameters:

- **SRCP Peer Number**—Specifies the media gateway controller number. The range is from 1-8.
- **SRCP Peer Name**—Specifies the name of the SRCP peer. The range is from 1-64 characters.

Step 5 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 6 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 7 Verify the statistics name and statistics value for the real-time counters.

Step 8 Check the **Poll All** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 9 Click **Refresh** to update the settings for the SRCP peer group for VISM-PR.

9.4.15 Diagnosing Connections

The Diagnostic Center is used to diagnose connections.The key functions are the ability to test status, delay and integrity of SPVC connections.

This task is used to test SPVC connection:

- 9.4.15.1 Polling a Connection for an SPVC

You can test the integrity of any existing connection that is nondisruptive to user traffic. The operation is similar to the **tstcon** command. For more information on the **tstcon** command, refer to the *Cisco WAN Switching Command Reference, Release 9.3.30*.

9.4.15.1 Polling a Connection for an SPVC

To poll a connection:

Step 1 In the Domain Explorer, select the node and choose **Configuration > MGX8880/8850 MG > Configuration Center**.

Step 2 Click the **Connections** tab to display the Connection Browser window.

Step 3 Drag the node from the Hierarchy pane to the right hand pane to display the connection details. Click the **Connection List** tab. See Figure 7-1.

Step 4 Click **More Filters** to display the Filter Settings window. See Figure 7-2.

Step 5 Choose the filter settings from the Filter Settings window. For example, check both the **Status** check box and the **OK** check box if you want to retrieve only active connections.

Step 6 Click **OK** to apply the filter settings.

Step 7 Enter the number of connections that you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter ***.

Step 8 Click **Get** to retrieve the connections. For example, you can retrieve both local and remote endpoints.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 9 You now test the connection. Right-click the SPVC connection from the list of connections and choose **Diagnostic Center**.

Step 10 In the Diagnostic Center, click the **Test Connection** tab.

Step 11 There are three radio button options:

- Click the **Test Conn** radio button to initiate an end-to-end integrity test of the selected connection.
- Click the **Test Delay** radio button to initiate an end-to-end measurement of round-trip delay.

Step 12 Check the **Poll Local** or **Poll Remote Endpoint** check box to initiate polling for the statistics. To select individual counters for polling, check the counter check box.

Step 13 Click the **Delta Mode** radio button or **Absolute Mode** radio button. See Table 9-6.

Step 14 Choose the polling interval time from the **Poll Interval (Sec)** drop-down arrow.

Step 15 Verify the statistics name and statistics value for the real-time counters.

Step 16 Click **Start Test Connection** to proceed with testing.

Step 17 Click **Abort Test Connection** to stop the test.

9.4.16 Bit Error Rate Test

Bit Error Rate Test (BERT) verifies the integrity of a network element by measuring error statistics that result from sending known bit patterns, analyzing a remote interface, and analyzing the pattern that is returned. BERT is used on DS3, DS1, and DS0/DS0 bundle interfaces.

BERT generates a known data sequence into a transmission device, and examines the received sequence at the same device or a remote device for errors. Tests are run on a full T1E1 line or a fractional T1E1, for example, single DS0 or a group of DS0s. BERT tests the quality of links by directly comparing a pseudo-random or repetitive test pattern with an identical, local-generated test pattern.

Note SRME, SRME/B, VXSM, VISM-PR, and AXSME card types support BERT.

BERT includes the following functions:

- Configures a local loopback on a line or port, or specifies a remote loopback be used instead.
- Defines the bit pattern.
- Specifies a duration for the BERT session after the session automatically terminates.
- Specifies BERT can start on a designated line or port.
- Lists BERT tests that are initiated from Cisco MGM.
- Refreshes the display to update the output for the current BERT.
- Stops a BERT started from Cisco MGM.

9.4.17 Configuring Bit Error Rate Test

You can setup BERT options on the looped back connection and use the available test patterns displayed in the BERT Configuration window. Before you configure the BERT options in the BERT Configuration window, make sure a line or port is selected from a BERT-supported service module.

In Cisco MGM, BERTs are only applicable on:

- AXSME 32 T1E1 (on DS1 Line)
- VXSM 48 T1E1 (on DS1 Line)
- VXSM OC3 (on DS1 Paths)
- VISM PR 8T1E1 (accompanied by an SRM Card, on DS1 Line)

This section also includes the following details:

- 9.4.17.1 Stopping Bit Error Rate Test
- 9.4.17.2 Modifying Bit Error Rate Test

To configure a BERT session:

Step 1 In the Diagnostic Center, double-click or drag the line or port that is supported by BERT from the Hierarchy pane to the right hand pane to display the Line and Port Configuration window.

Step 2 Click the **Bert** tab to display the BERT Configuration window. See Figure 9-10.

Note Not all the BERT configuration parameters are applicable for all card types.

Step 3 Choose the test pattern options from the **Test Pattern** drop-down arrow.

The default option is **allZeros**.

Step 4 Choose one of the following Invert Rx Test options from the **Invert Rx Test Pattern** drop-down arrow:

- **Not Inverted**
- **Inverted**

Step 5 Choose one of the following Invert Rx Test options from the **Invert Tx Test Pattern** drop-down arrow:

- **Not Inverted**
- **Inverted**

Step 6 Ensure that the type of end device and loopback device option is correct from the **Device To Loop** drop-down arrow.

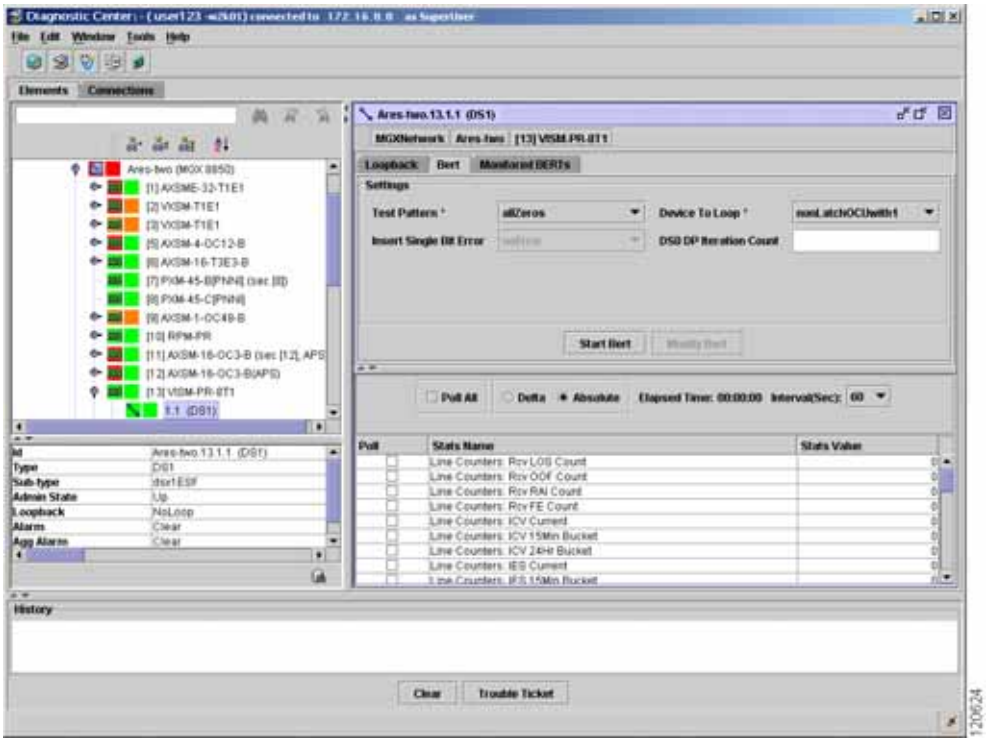
Step 7 Choose the error insertion option from the **Error Insertion** drop-down arrow.

The insert constant-rate error option verifies that the transmitted pattern is being properly received and errors are properly detected. Once set to send continuous errors, errors are inserted at the configured rate until set to **no Error** option.

If you set the value to insert errors while the test is not running, the test is not affected. However, when the test is started again, errors are inserted at the configured rate.

Step 8 Click **Start Bert** to initiate the BERT session. Note that once BERT is started, you can restart it with the modified options.

Figure 9-10 Diagnostic Center—BERT Options



9.4.17.1 Stopping Bit Error Rate Test

While the BERT session is running, you can stop the session from the BERT Configuration window that is applicable to your selected line or port. From the BERT Configuration window, click **Stop Bert** to stop the session.

9.4.17.2 Modifying Bit Error Rate Test

After you stop a BERT session, you can modify the session.

To modify a BERT:

Step 1 Choose one of the following single-bit error options from the **Insert Single Bit Error** drop-down arrow:

- No Error
- Insert Error

Step 2 Click **Modify Bert** to modify the BERT line by inserting a single-bit error in the transmitted BERT pattern.

9.4.18 Displaying Bit Error Rate Test

After initiating a BERT session, you can view the status of all initiated BERT sessions at once. To display BERT status:

Step 1 In the Diagnostic Center, double-click or drag the line or port that is supported by BERT from the Hierarchy pane to the right hand pane to display the Line and Port Configuration window.

Step 2 Click the **Monitored BERTs** tab to display the Monitored BERTs window. See Figure 9-10.

Table 9-7 describes the parameters for the BERT statistics.Select the BERT entry to update the statistics, and click **Refresh**.

Table 9-7 Bit Error Rate Test Statistics Parameters

Name	Definition
Start Date and Time	Specifies the start date and time.
Operation Status	Specifies the current operation status of BERT.
Failed Reason	Defines the reason for the BERT failure. If the Operation Status parameter is set to BERT Failed, more information is available.
Bits Transmitted	Specifies the total number of bits.
Bits Received In Error	Receives the total number of bit errors.
Error Inject Count	Specifies the total number of injected bit errors.

9.5 Where Is the Fault?

You need to be able to quickly troubleshoot problems on the network, identify when network capacity is being reached, and provide information to management on the number and types of devices being used on the network. If the network goes down, one of the first things you will need to know is what devices are running on the network. You will want to know the types of devices you are dealing with as well as the names, addresses, and interfaces associated with each device in order to begin troubleshooting the problem. The more information you have about all your devices in one central place, the easier it is to locate necessary information, resolve problems quickly, and provide detailed information to interested parties.

9.5.1 Sources of Information
9.5.2 Identifying and Monitoring Alarms
9.5.3 Using Visual and Audible Alarm Notifications
9.5.4 Sources of EMS Raised Alarms
9.5.5 Viewing Fault Management Data for a Set of NEs

9.5.1 Sources of Information

Fault management receives and processes information from the following sources:

- Autonomous reports of failures from NEs
- Trouble reports from customers and peer systems
- Results of diagnostics, exercises and audits from NEs
- Impairment indications from performance management
- Network configuration data from configuration management.

Cisco MGM constantly updates the alarm status of the network based on the alarm and event notifications sent by the monitored NEs and generated by the EMS itself. It performs alarm synchronization with the NE each time the connection to the NE is established or re-established and the NE is in service.

9.5.2 Identifying and Monitoring Alarms

There are a number of options available to identify and monitor alarms on the entire domain or in a group of NEs:

- In the Domain Explorer Hierarchy pane, select the management domain node or a group node. If it shows a critical, major, minor, or warning alarm icon, it means that one or more NEs within the management domain or group are experiencing an alarm.
- Select the management domain node or group node and choose **Fault > Alarm Browser** (or right-click the node and choose **Alarm Browser** in the popup menu). This opens the Alarm Browser window, which shows all the NEs in the management domain or group that are experiencing a critical, major, minor, or warning alarm. See Figure 9-3.
- Click an alarm count box in the Dashboard, the Alarm Browser appears, prefiltered for the selected alarm severity.
- Click the **Open Alarm Browser** tool from the Dashboard to show Cisco MGM specific EMS alarms in the Alarm Browser.
- Click the **Open Cisco MGM EMS Alarm Browser** tool from the Dashboard to show alarms on Cisco MGM in the Alarm Browser.

To identify and monitor alarms on specific NEs:

Step 1 Select an in-service NE in the Domain Explorer Hierarchy pane that shows an alarm icon.

Step 2 Choose **Fault > Alarm Browser**, or right-click and choose **Alarm Browser** in the popup menu.

Note Alarms relating to PM collection indicate that the load on the system is high. Reduce the load on the system before proceeding.

Note No alarms or events will be generated in the Alarm Browser if Oracle shuts down.

9.5.3 Using Visual and Audible Alarm Notifications

To use visual and audible alarm notifications:

Step 1 In the Domain Explorer window, choose **Edit > User Preferences**.

Step 2 The User Preferences dialog box appears. On the Event Notification tab, in the Show Notification Dialog area, select whether or not an alert popup opens when a specific alarm or informational event occurs on NEs in the management domain or in the application.

The Event Notification dialog box opens whenever a new alarm or event occurs. According to your User Preferences selection, you will receive popup notification about alarms by severity and information on events from the network element (NE) or from Cisco MGM. The Event Notification popup remains open until one of the following occurs:

- You click OK to close the dialog box.
- It is replaced by an Event Notification dialog box with a higher severity.
- You click Disable to disable all event notifications.

The Event Notification displays the information shown in Table 9-8.

Step 3 In the Play Audible Notification area, select whether or not an audible alert is sounded when a specific alarm or informational event occurs on the NE or in the application. You can also select whether or not a continuous audible alert is sounded when there is an update in the Dashboard. Check the **Continuous Alarm for Dashboard notifications** check box.

Note To stop the continuous audible alert, choose **Fault > Stop Continuous Beep** in the Domain Explorer.

Step 4 Check the **Save current settings** check box and click **OK**.

Tip Click **Disable** on the popup window itself to disable additional popups.

Table 9-8 Event Notification Dialog Box Descriptions

Field	Description
Source	Displays the name of the source where the alarm or event originated.
Time	Displays the date and time that you received the Event Notification popup.
Category	Indicates the category of alarm or event; alarm categories include Critical, Major, Minor, or Cleared. Event categories include NE Event (if the event occurred on a NE) or EMS Event (if the event occurred on Cisco MGM).
Probable Cause	Identifies the probable cause of the alarm or event.
Affected Object	Identifies the object that is affected by the alarm or event.

Table 9-8 Event Notification Dialog Box Descriptions (continued)

Field	Description
Description	Displays a brief description of the alarm or event.
Service Affecting	Indicates whether the alarm or event affects service.

9.5.4 Sources of EMS Raised Alarms

In addition to reporting NE-generated alarms, the EMS monitors and reports alarms on the EMS itself; for example, loss of connectivity to NE, and so forth.

The EMS monitors and reports the NE-specific alarms (see Table 9-9) and non-NE-specific alarms (see Table 9-10).

See Appendix F, "Cisco MGM CORBA Gateway Events" for details of the Cisco MGM CORBA Gateway events.

Note NE-specific alarms can be viewed and accessed by users who are assigned to the particular NE.

Table 9-9 EMS-NE-Specific Alarms

NE-Specific Alarms	Description
Loss of communication to an NE	When the system detects loss of connectivity to an NE, an EMS alarm is generated in the Alarm Browser. This EMS alarm is cleared when the system reestablishes connectivity to the NE or when the NE is marked Out of Service.
Automatic or manual memory backup failure	If an automatic or manual memory backup job fails, an EMS alarm is generated in the Alarm Browser. An individual EMS alarm is generated for each memory backup failure that occurs. All instances of the backup-related EMS alarms are cleared (for that particular NE) when the memory backup succeeds or when the NE is marked Out of Service.
Switching IP addresses	When an active IP address switches from the primary to the secondary IP address, an alarm will be generated. It is only cleared when the address is switched back to the primary IP address or when communication to the NE is lost.
Failed PM data retrieval	An alarm will be generated for every PM data retrieval failure. PM 15-min Retrieval Fail Alarms are generated if the system has not retrieved 15-min PM data after the number of times to retrieve PM data has been reached. These alarms can be cleared manually or cleared automatically if a Lost PM alarm is generated or if PM data is retrieved.
Lost PM data	An alarm will be generated for all lost PM data. PM lost alarm 15-minute is generated when: • The EMS is not able to collect PM data for 15 minutes and the NE's PM collection is set to 15 Min. • The EMS is not able to collect 15-minute PM data after 8 hours. If there are outstanding PM 15-min Retrieval Fail Alarms, these alarms will be cleared and the PM 15-min Lost PM Bucket Alarm is generated. These alarms can be cleared manually. Lost PM data alarms are generated only if the PM collection is set to 15-Min.

Table 9-10 Non-NE-Specific Alarms

Non-NE-Specific Alarms	Description
Maximum number of login attempts exceeded	By default, users have a maximum of five login attempts. The user account is locked after the fifth unsuccessful login attempt and an EMS alarm is generated in the Alarm Browser. The alarm is cleared once the user account is unlocked or the account is deleted.
System self-monitor alarm	Threshold parameters such as CPU usage, memory usage, disk usage, circuit creation time, PM collection time, and resynch time are collected and evaluated to monitor the server performance. An alarm is generated if any of these parameters cross their threshold values with their corresponding severity level. The alarms are cleared only after the corresponding parameter value falls below the minor threshold. Subsequent threshold crossings for the same parameter will not generate further alarms. Only the severity level is changed to indicate the current severity level for the specific parameter. **Note** Alarms associated with circuit creation, configuration resynchronization, NE synchronization, and PM collection indicate that the load on the system is high. Reduce the load on the system before proceeding. Alarms associated with pruning times also indicate that the load on the system is high. Reschedule pruning at a time when the system has less activity.

9.5.5 Viewing Fault Management Data for a Set of NEs

To view fault management data for an NE:

Step 1 In the Domain Explorer Hierarchy pane, select the management domain, group, or NE node for which to view the data.

Step 2 Open an Alarm Browser, choose **Fault > Alarm Browser**.

Note A preliminary filter is always applied based on the object selected in the tree view or map.

Step 3 In the table, click the **Filter Data** tool (or choose **File > Filter**). The Filter dialog box appears.

Step 4 Most fault management tables (for example, the Alarm Browser and Alarm Log tables) have a filter tool for filtering data for a set of NEs. In the Filter dialog box, select the NEs that will be included in the filter. Specify other filter parameters, as needed. See 9.7.2 Filtering the Alarm Log.

Step 5 Click **OK** to show the results in a table.

9.6 How Can I Use Advanced Debugging to Find the Cause of the Fault?

Advanced debugging captures additional information about defects.

The EMS should correlate events and determine the faults that exist in the network. To correlate events means to look for relationships between them.

Advanced debugging can be carried out using information from the following sources:

- 9.6.1 Setting an EMS Process as Critical
- 9.6.2 Setting Up and Viewing Error Logs
- 9.6.3 Setting Debug Options

9.6.1 Setting an EMS Process as Critical

You can mark an EMS service as critical for process monitoring purposes. To set a process as critical:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 Click **Recovery Properties** to open the Recovery Properties sheet.

Step 3 Click the Process Monitoring tab. Table 9-11 describes the fields within the Process Monitoring tab. The system services listed are:

- Service Manager
- Oracle Service
- OS Agent
- GateWay/CORBA Service
- MGX8880/8850 NE Service
- MGX8880/8850 PM Service

Step 4 Check the Critical check box beside each service to indicate that the service is critical.

Note The Service Manager, Oracle Service, and OS Agent are permanently critical. You cannot uncheck the Critical check boxes for these services.

Note If a critical process stops running or it fails to poll monitoring services for a long time, the server will be shut down and the client will generate an alarm.

Table 9-11 Recovery Properties—Process Monitoring Tab

Field	Description
Service Name	Displays the process monitoring service name.
Critical	If checked, the selected service is designated as critical for process monitoring. Service Manager, Oracle Service, and OS Agent cannot be unchecked.

9.6.2 Setting Up and Viewing Error Logs

The Error Log tables display server error information that is useful for debugging Cisco MGM processes. In most cases, the Error Log is requested by service personnel for debugging a problem on the Cisco MGM server. The Error Log captures abnormal and significant events based on severity level. Critical, major, minor, and informational errors are saved in the database.

There are two types of Error Log available in Cisco MGM:

- Error logs for the Diagnostic Center, Configuration Center, Statistics Report and Chassis View. These Error Logs are accessed directly from the log directory on the server at /opt/root/log.
- Error logs for the other applications in Cisco MGM. Choose **Administration > Error Log** to view these Error Logs.

As the default, the Error Log displays information about significant events that occurred during the last four hours. You can change the default time period in the User Preferences dialog box.

The Error Log Configuration property sheet allows the user to control the volume of messages that are created by the server. All changes take effect immediately and do not require restart of the server. To reduce the amount of information logged to the database, turn off entire components. To set up and view Error Logs:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Click **Error Log Properties** to open the Error Log Configuration property sheet. The Error Log property sheet displays the information in Table 9-12:

Table 9-12 Field Descriptions for the Error Log Properties

Field	Description
Cisco MGM Server and GateWay/SNMP	Allows you to choose the error level to include in the Error Log for services related to the Cisco MGM server and GateWay/SNMP. Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file. **Caution** Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer. **Note** Trace and debug information does not appear in the Error Log table.
SM Service	Allows you to choose the error level to include in the Error Log for the SM service. Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file. **Caution** Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer. **Note** Trace and debug information does not appear in the Error Log table.
SNMP Trap Service	Allows you to choose the error level to include in the Error Log for the SNMP Trap service. Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file. **Caution** Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer. **Note** Trace and debug information does not appear in the Error Log table.

Step 2 In the Error Level field, choose the error level that will be included in the Error Log (Critical, Major, Minor, Informational, Debug, or Trace). Critical, major, minor, and informational errors are logged to the database; trace and debug information are logged to a log file.

Caution When the trace or debug option is left on, it can lead to an insufficient disk space situation. Use these options only when troubleshooting with a customer support engineer.

Step 3 Click **Save**.

To open the Error Log, choose **Administration > Error Log** in the Control Panel window menu bar. The Error Log displays the information shown in Table 9-13.

Table 9-13 Error Log Descriptions

Column Name	Description
Cisco MGM Time Stamp	Displays the date and time when the error occurred on the Cisco MGM server.
Module	Displays the name of the module where the error occurred.
Severity	Displays the severity level of the error (see Table 9-15 for a description of the severity levels).
Submodule	Displays the name of the submodule where the error occurred.
Filename	Displays the name of the file where the error occurred. Cisco technical support engineers use this information for troubleshooting.
Line	Describes the exact line where the error occurred. Cisco technical support engineers use this information for troubleshooting.
Message	Displays the text of the error message.

Note Each NE service and PM service has an error level selection. For example, choose **Control Panel > NE Service** or **PM Service > MGX8850** or **MGX8880**. In the **Error Level** drop-down list, choose the error level to include in the Error Log for the selected NE service or PM service. Click **Save**.

Step 4 You can filter the Error Log data according to criteria that you select and to display the results in the Error Log table. Table 9-14 details the options available:

Table 9-14 Error Log Filter Dialog Box Descriptions

Tab	Description
Time Stamp (time zone)	Allows you to filter Error Log data for a specified time period, ranging from the past hour to the past 6 months. You can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. If you want to filter Error Log data and the time period is not important, click **No Time Specified**.
Modules	Allows you to filter Error Log data by Cisco MGM module.
Submodules	Allows you to select Cisco MGM server submodules to filter Error Log data.
Severity	Allows you to filter Error Log data based on severity level: Critical, Major, Minor, and Informational.

The Error Log window shows Cisco MGM server error information that is useful for debugging purposes. The Error Log captures abnormal and significant events based on severity. Table 9-15 shows the severity levels.

Table 9-15 Severity Levels and Error Log

Severity Level	Description
critical major minor informational	When set to any of these severity levels, all messages corresponding to critical, major, and minor severity levels are logged to the database and all informational messages are stored in the log file.
debug trace	When set to debug or trace, all informational and higher messages are logged to the database. All debug and trace messages are logged to the log files.

All messages are logged to the following files in the /opt/CiscoMGMServer/log directory:

- MGMTL1FWDerror.log
- MGX8880NEService-*number*.log
- MGX8880NEService-*number*Error.log
- MGX8880PMService-*number.l*og
- MGX8880PMService-*number*Error.log
- UnmanagedNEService-*number*.log
- UnmanagedNEService-*number*Error.log
- SnmpTrapService.log
- SnmpTrapServiceError.log
- CORBAGWService.log
- CORBAGWServiceError.log

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

After resetting the Error Log level to critical, major, minor, or informational, remove the log files to free disk space. Each time a new log file is started, a backup of the previous file is kept in the *log-file*.bak file. Remove the backup file at any time.

9.6.3 Setting Debug Options

In Cisco MGM, the debug option gives you information to investigate, diagnose and fix a problem.

Note If required, set the debug levels for specific Cisco MGX NE backend processes by updating the debug parameter in the configuration file for that process in the /opt/svplus/config directory. See Table 9-16. When the changes are made, stop, then restart the Cisco MGM server.

Table 9-16 Cisco MGM Processes and Configuration Files

Process	ConfigFile	Parameter	Range	Default
AuditLogger	AuditLogger.conf	DB_LEVEL	[1..5]	5
cmgrd	-none-	-none-		
cmsvr	cmsvr.conf	LOG_LEVEL	[1..7]	7
configserver	configserver.conf	LOG_LEVEL	[1..7]	7
cwmftpd	cwmftpd.conf	LOG_LEVEL	[1..7]	7
cwmsmap	-none-	-none-		
DCServer	DCServer.conf	LOG_LEVEL	[1..7]	7
dmd	dmd.conf	LOG_LEVEL	[1..7]	7
		SYNCUP_LOG_LEVEL	[1..7]	4
eventd	-none-	-none-		
ILMITopoc	ILMITopoc.conf	Debug Level	[1..5]	2
NMServer	NMServer.conf	LOG_LEVEL	[1..7]	7
		STARTUP_LOG_LEVEL	[1..7]	7
nts	nts.conf	DEBUG_LEVEL	[1..5]	5
ooemc	emd.conf	OODebug Level	[1..7]	6
pmcollector	pmcollector.conf	LOG_LEVEL	[1..7]	7
RtmProxy	SNMPProxy.conf	-none-		
sdbroker	sdbroker.conf	LOG_LEVEL	[1..7]	7
		SYNCUP_LOG_LEVEL	[1..7]	4
snmpcomm	snmpcomm.conf	DEBUG_LEVEL	[1..5]	4
srtserver	srtserver.conf	LOG_LEVEL	[1..7]	7
statsparser	statsparser.conf	LOG_LEVEL	[1..7]	7
topod	Topod.conf	Debug Level	[1..5]	2

Specifying the debug options allows you to choose the parameters that will be displayed in the debug log.

To set the debug options:

Step 1 In the Domain Explorer, choose **File > Debug Options**.

Step 2 Specify the debug options. The options available in the Debug Options dialog box are described in Table 9-17.

Step 3 Click **Apply**.

Table 9-17 Field Descriptions for the Debug Options Dialog Box

Field	Subfield	Description
Modules	—	Select modules that will display debug messages. Use the **Add** and **Remove** buttons to move modules to the Selected list or remove modules from the list.
Debug Level	Fatal	Instructs the Debug Log to display messages with a severity level of at least Fatal.
	Warning	Instructs the Debug Log to display messages with a severity level of at least Warning.
	Info	Instructs the Debug Log to display messages with a severity level of at least Info.
	Debug	Instructs the Debug Log to display messages with a severity level of at least Debug. **Caution** Cisco MGM performance will degrade significantly if the Debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use Debug only when troubleshooting with a Cisco customer support engineer.
	Trace	Instructs the Debug Log to display messages with a severity level of at least Trace. **Caution** Cisco MGM performance will degrade significantly if the Trace option is left on. All operations will slow down and you may lose alarm and event notifications. Use Trace only when troubleshooting with a Cisco customer support engineer.

Table 9-17 Field Descriptions for the Debug Options Dialog Box (continued)

Field	Subfield	Description
Display Options	File	Check the **File** check box to write the Debug Log to a specific file. You can click **Browse** to browse for a local client directory for the Debug Log. After you specify the filename, the log is stored at <*filename*>0.log and <*filename*>1.log when <*filename*>0.log is filled to its maximum size. By default, the Debug Log is saved at C:\Cisco\MediaGatewayManagerClient<*version_number*>\debug\MGMC-debug0.log or /opt/CiscoMGMClient<*version_number*>/debug/MGMC-debug0.log. The dialog box shows the filename without the number 0 or 1, which is appended by default by the Java debugging APIs. **Note** <*version_number*> is replaced by the version number of the installed Cisco MGM client.
	Max File Size	Enter the maximum file size for the Debug Log, in bytes.
	Telnet	Check the **Telnet** check box to write the Debug Log to a Telnet port. **Note** Telnet to the IP address of the Cisco MGM client workstation, not the Cisco MGM server.
	Console	Check the **Console** check box to write the Debug Log to the console.

9.7 What Is the Fault Priority?

After you have gathered information about the faults, it is then important to prioritize that information. There are several ways to determine the priority of a fault. You can simply assign a priority to an NE or group, or you can try to derive this information from a knowledge of the network.

The priority of a fault can vary depending on a variety of factors, such as:

- Influences outside of the network (for example, the time of day an outage occurs)
- Amount and type of traffic that will be affected
- Who specifically is affected by the fault
- Potential financial consequences

You can decide to filter events. Filtering means to identify events that do not need to be processed immediately, or might never need to be processed. Because the volume of events to be processed can be high, it is important to filter unwanted events as soon as possible.

You can get information for prioritizing faults in the following sections:

- 9.7.1 Alarm Severity Levels
- 9.7.2 Filtering the Alarm Log
- 9.7.3 Filtering Data by Time

9.7.1 Alarm Severity Levels

Cisco MGM supports the following alarm severities in the Alarm Browser:

- Critical (CR)—Red
- Major (MJ)—Orange
- Minor (MN)—Yellow
- Warning (WR)—Cyan (blue-green)

9.7.2 Filtering the Alarm Log

By default, the Alarm Log shows alarm and event information that occurred during the last 4 hours. Use the drop-down menu to the right of the time-based filter tool to filter event data for the past 4 hours, past 8 hours, past 12 hours, past day, or past week.

Step 1 In the Domain Explorer Hierarchy pane, select a domain, group, or NE and choose **Fault > Alarm Log**.

Step 2 To set the filter time to start immediately, choose **Fault > Reset All Events**.

To filter the data in the log, click the **Filter Data** tool (or choose **File > Filter**). The Alarm Log Filter dialog box contains the information detailed in Table 9-18.

Step 3 When all filter criteria have been specified, click **OK** to run the filter.

Table 9-18 Field Descriptions for the Alarm Log Filter Dialog Box

Tab	Description
Cisco MGM Time Stamp (time zone)	Allows you to filter alarm and event data for a specified time period, ranging from the past hour to the past 6 months. Additionally, you can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. If you want to filter alarms and events and the time period is not important, click **No Time Specified**. Click **From Now Onward** to set the filter time to start immediately and continue until you change filter parameters.
Source ID	Allows you to move network elements (NEs) back and forth between the list of Available Source IDs and Selected Source IDs and then run the Alarm Log Filter. If you have the appropriate user permission, you can filter Cisco MGM EMS alarms and events by selecting **MGM** and adding it to the Selected Source ID list. If more than 100 NEs are selected, the Source ID tab becomes gray and all devices are included in the filter criteria you specify.
Module Name	Allows you to specify which module types you want to include in the filter. The modules displayed depend on the NE selection in the Domain Explorer Hierarchy pane when the Alarm Log is opened. Use the **Add** and **Remove** buttons to filter the display to specific modules. The Alarm Log displays events for modules listed under Selected Module Name.

Table 9-18 Field Descriptions for the Alarm Log Filter Dialog Box (continued)

Tab	Description
Affected Object	Allows you to specify which objects you want to include in the filter. The objects displayed depend on the NE selection in the Domain Explorer Hierarchy pane when the Alarm Log is opened. Use the **Add** and **Remove** buttons to filter the display to specific objects. The Alarm Log displays events for entities listed under Selected Affected Object. To filter NE-specific EMS alarms, select **MGM** and add it to the Selected Affected Object list.
PS	Allows you to filter data based on the perceived severity (PS) of the alarm or event. Additionally, you can filter service affecting alarms and events, non-service affecting alarms and events, and/or not-available alarms and events (alarms and events where the service affecting status is not known).
Physical Location	Allows you to filter data based on the physical location of an NE or its components. To view the tab, an NE must be selected in the Domain Explorer Hierarchy pane. The filters that are available depend on the NE selected.
ID	Allows you to filter data based on alarm or event ID. Enter a starting ID and an ending ID; then, run the filter to see only the alarms or events that occurred within the specified range of IDs. Check the **Disregard All The Other Filter Criteria** check box to ignore all other filter specifications. In addition, you can filter the view to only alarms, only events, or both alarms and events.
NE Alarm Time (time zone)	Allows you to filter alarm data for a specified time period, ranging from the past hour to the past 6 months. Additionally, you can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be Greenwich mean time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. If you want to filter alarms and the time period is not important, click **No Time Specified**. Click **From Now Onward** to set the filter time to start immediately and continue until you change filter parameters.

9.7.3 Filtering Data by Time

Most fault management tables (for example, the Alarm Browser and Alarm Log tables) have a filter tool for filtering data for a set of NEs. A preliminary filter is always applied based on the object selected in the tree view or map.

To filter data by time:

Step 1 In the Domain Explorer Hierarchy pane, select the node for which to filter time-based fault management data. Choose **Fault > Alarm Browser**.

Step 2 In the Alarm Browser, click the **Filter Data** tool (or choose **File > Filter**). The Filter dialog box appears.

Step 3 In the Filter dialog box, click the **NE Alarm Time** tab. Click one of the following radio buttons:

- Past Hour to Past Month—Filters data for a specified time period, ranging from the past hour to the past month.
- From Now Onward—Sets the filter time to start immediately and continue until filter parameters are changed.
- No Time Specified—Filters data without specifying a time period.
- User Specified—Allows you to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be local time, GMT, or an offset from GMT, depending on what is specified in the User Preferences dialog box.

Step 4 Click **OK** to show the results in the table.

Note Clicking Refresh Data resets the time-based filter. The filter retrieves data for the specified interval, beginning when the Refresh Data tool is clicked. For example, if the specified interval is Past Hour and Refresh Data is clicked at 3:02 P.M., the filter retrieves data that occurred between 2:02 P.M. and 3:02 P.M. If the specified interval is From Now Onward at 8:00 P.M., data is retrieved beginning at 8:00 P.M. and the time is reset only after From Now Onward is clicked again.

9.8 Who Is Responsible for Managing the Fault?

To manage faults effectively, you must know who is taking responsibility for managing each case. Cisco MGM offers the following options:

- 9.8.1 Configuring Alarm Acknowledgement and Alarm Notes
- 9.8.2 Acknowledging and Unacknowledging Alarms

9.8.1 Configuring Alarm Acknowledgement and Alarm Notes

To configure alarm acknowledgment, and enable or disable the alarm note feature:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel** and click **UI Properties**.

Step 2 Under fault management, select either Manual or Automatic Alarm Acknowledgement.

- If you choose **Manual Alarm Acknowledgment**, alarms must be acknowledged manually. Cleared alarms move from the Alarm Browser to the Alarm Log once they are acknowledged.
- If you choose **Automatic Alarm Acknowledgment**, the server automatically acknowledges alarms when they are cleared and moves them from the Alarm Browser to the Alarm Log.

Note Active alarms are not automatically acknowledged.

If the alarms are initially set to Manual Alarm Acknowledgement, and then you switch to Automatic Alarm Acknowledgement, all the alarms in the Alarm Browser will be cleared and acknowledged automatically. This might take a while, depending on the number of alarms in the database that have not been acknowledged manually.

You can still acknowledge alarms manually even if Automatic Alarm Acknowledgment is set.

Step 3 Use the Overwrite Alarm Notes option to enable or disable the ability to overwrite alarm notes created by another user.

Step 4 Select either Enable or Disable Alarm Un-Acknowledgement.

- If you choose **Enable Alarm Un-Acknowledgement**, you can unacknowledge alarms in the Alarm Browser.
- If you choose **Disable Alarm Un-Acknowledgment**, alarms can only be acknowledged in the Alarm Browser.

Step 5 Click **Save**.

9.8.2 Acknowledging and Unacknowledging Alarms

If you enable automatic alarm acknowledgment in the Control Panel > User Interface Properties sheet, the server automatically acknowledges alarms when they are cleared and transitions the alarms to the Alarm Log. If you enable manual alarm acknowledgment, you manually acknowledge a cleared alarm; then, the alarm transitions to the Alarm Log.

The alarm acknowledgement feature acknowledges selected alarms or all alarms with a single click. See Appendix A, "Icons and Menus" for more information about alarm acknowledgment tools.

To acknowledge or unacknowledge alarms:

Step 1 In the Domain Explorer window, select an NE and choose **Fault > Alarm Browser**. This opens the Alarm Browser window for the selected NE.

The Alarm Browser window lists critical, major, minor, and warning alarms that have not been cleared or cleared alarms that have not been acknowledged.

Step 2 Select the alarms to be acknowledged and choose **Fault > Acknowledge Alarms** (or click the **Acknowledge Selected Alarm(s)** tool). Click **Yes** in the confirmation dialog box. Click the **Refresh Data** tool to see the changes. A check mark icon provides a visual indication of acknowledged alarms.

When cleared alarms are acknowledged, they transition from the Alarm Browser to the Alarm Log. For more information about the Alarm Log, see the "9.9.1 Archiving Alarm Log" section on page 9-50.

Step 3 Click the **Acknowledge Selected Alarm(s)** tool again to unacknowledge the selected alarms. Click **Yes** in the confirmation dialog box. Click **Refresh Data** to see the changes. The check mark will be removed, indicating that the alarm has been unacknowledged.

Note Alarm unacknowledgement is disabled by default. Make sure to enable the alarm unacknowledgement feature in the Control Panel before unacknowledging an alarm. See the "9.8.1 Configuring Alarm Acknowledgement and Alarm Notes" section on page 9-48 for more information.

Step 4 To acknowledge all alarms in the view, choose **Fault > Acknowledge All Alarms** (or click the **Acknowledge All Alarms** tool). Click **Yes** in the confirmation dialog box.

Choose **Fault > Show Alarm Note** (or click the **Show Alarm Note** tool) to read any comments that have been entered for the selected alarm and to enter additional comments. You can add comments to the previous comments, click the **Append** radio button. To overwrite the previous comments, click **Replace**. To delete the comments, click **Delete**.

Note You can enable and disable the Replace and Delete functions in the **Control Panel > User Interface Properties sheet**.

9.9 How Did You Manage the Fault?

Alarm information can be useful to evaluate the actions taken, for a number of reasons:

- How sure are you that the problem cannot recur?
- What other devices need the same fix?
- Do you know the root cause of the problem?
- What can you do to prevent this problem from reoccurring?
- What new problems could occur when you apply this fix?

In Cisco MGM, you can get information to make this assessment by doing the following:

- 9.9.1 Archiving Alarm Log
- 9.9.2 Exporting Alarms and Events to a Text File

9.9.1 Archiving Alarm Log

The Alarm Log window contains alarms that have transitioned from the Alarm Browser. In order for an alarm to transition from the Alarm Browser to the Alarm Log, it must be cleared and acknowledged. In addition, the Alarm Log shows all transient conditions (also known as events). Events have a single possible severity of Indeterminate and do not have associated clear messages. Events are placed directly into the Alarm Log. They do not appear in the Alarm Browser.

By default, the Alarm Log shows alarm and event information that occurred during the last 4 hours. To view the Alarm Log:

Step 1 In the Domain Explorer Hierarchy pane, select a domain, group, or NE.

Step 2 Choose **Fault > Alarm Log**. The Alarm Log appears and displays the information detailed in Table 9-19.

:

Table 9-19 Field Descriptions for the Alarm Log Window

Field	Description
ID	Unique number that the system uses to identify a particular alarm or event.
Source ID	NE or EMS where the selected alarm or event occurred.
Affected Object	Object where the selected alarm or event occurred. For NE-specific alarms, the affected object fields will display “MGM”. For the non-NE specific alarms: • Maximum number of login attempts exceeded alarm—The affected object field displays the user ID associated with the alarm. • Cisco MGM self monitor alarm—The affected object field displays the threshold parameter associated with the alarm.
Module Name	Name of the module where the selected alarm or event occurred.
Physical Location	Physical location of the equipment where the selected alarm or event occurred.
Probable Cause	Probable cause of the selected alarm or event.
PS	Perceived severity of the alarm before it was cleared. Severity can be Critical, Major, Minor, Warning, or Indeterminate. The background color of the column indicates the alarm status. A green background indicates that the alarm is cleared.
SA	Indicates whether the alarm or event is service affecting. Values are: • Yes if its service affecting • No if its not service affecting • N/A if no information is provided by the NE
MGM Time Stamp (GMT)	Date and time when the alarm or event occurred on the server.
MGM Clear Time	Date and time when the alarm was cleared on the server.
MGM Duration	Amount of time required to clear an alarm (MGM Clear Time Stamp – MGM Time Stamp) in dddd:hh:mm:ss format.
NE Time Stamp	Date and time when the alarm or event occurred on the NE.
NE Clear Time	Date and time when the alarm or event was cleared on the NE.
Description	Brief description of the selected alarm or event. If no description is entered, this field is blank.

Table 9-19 Field Descriptions for the Alarm Log Window (continued)

Field	Description
Acknowledged Username	Login name of the user who acknowledged the alarm or event. **Note** MGM is the username registered for alarms that are automatically acknowledged. Automatic acknowledgement does not overwrite the username of manually acknowledged alarms.
Acknowledged Time	Date and time when the alarm or event was acknowledged. **Note** If the alarm acknowledgement is set to Automatic and you can manually acknowledge an alarm, the Acknowledged Time is not overwritten when the alarm clears.
Note	Any notes that were entered for the selected alarm or event. This field also shows the login name of the user who entered the note and the time stamp when the note was entered.

9.9.2 Exporting Alarms and Events to a Text File

Use the Event Export Manager to export alarms and events to a text file as they occur. In addition, you can use the Event Export Manager to set various export parameters to refine the export.

Step 1 In the Domain Explorer window, choose **Fault > Event Export Manager**.

Step 2 The Event Export Manager appears. In the Available Network Elements list, select the NEs that you want to export and click **Add**. In the Selected Network Elements list, select the NEs that you do not want to export and click **Remove**.

Step 3 To export Cisco MGM-specific alarms and events, check the **Export Cisco MGM EMS Alarms/Events** check box.

Step 4 In the Severity area, check the **Critical**, **Major**, **Minor**, **Warning**, **Indeterminate**, and/or **Cleared** check boxes. Alarms and events with a corresponding severity level will be exported.

Step 5 Specify a destination for the file in the Export To area. Click **Browse** to browse for a particular destination. The files can also be overwritten or appended.

Step 6 Select a field separator type in the Export Options area. In addition, check the **Stop Export when** check box, and enter a number of records. The Event Export Manager will stop exporting after the user-specified number of records are exported.

Step 7 Click the **Start Export** tool. The Event Export Manager exports alarms and events to the specified file until **Stop Export** is selected, or until the current Cisco MGM session ends.

CHAPTER 10

Managing Performance

Cisco MGM collects performance data which is used to manage and improve the performance of the network. This chapter includes the following information:

- 10.1 What Is Performance Management?
- 10.2 What Performance Data Is Available?
- 10.3 How Is Performance Data Collected?
- 10.4 Where Can I See the Performance Data?
- 10.5 What Types of Data Reports Are Available?
- 10.6 How Is Performance Data Stored?

10.1 What Is Performance Management?

Performance management (PM) in a network is the configuration and measurement of network traffic for the purpose of providing a consistent and predictable level of service. Performance management involves monitoring the network activity and adjusting the design and/or the configuration of the network in order to improve its performance and traffic handling. It provides network and system performance reporting for determining acute and chronic problems, service level reporting and performance optimization.

Measuring performance can identify:

- Normal baseline network performance, which can then be compared to perceived abnormal network behavior.
- Current or potential utilization problems

Performance data is useful for capacity reporting when drafting budgets or considering network redesigns. It can be used to identify congestion and trouble areas in the network that need to be relieved, either through additional equipment or through network reconfiguration. It can also be used to identify devices that are being underutilized or have available chassis slots.

Performance measurement includes:

- Performance monitoring—The collection of performance-related data from network devices. This data is useful for fine-tuning the performance of the device and for monitoring potentially service affecting problems.
- Performance reporting—The presentation of the collected data, which can then be used to analyze faults, growth, and capacity of the network.

The performance management process is as follows:

1. Gather network data and statistics
2. Analyze network performance and identify network critical issues
3. Optimize network performance
4. Plan customer capacity
5. Plan network capacity

10.2 What Performance Data Is Available?

The following areas of performance are useful for measurement:

- Availability—The amount of time for which a network system or application is available to the user. From a network perspective, availability is the reliability of the individual components in the network. Accurately measuring availability of a distributed network is difficult and not very practical.
- Accuracy—The amount of interface traffic that does not result in error. Accuracy can be expressed in terms of a percentage that compares the success rate to the total packet rate over a period of time. A decreased accuracy rate should be used to trigger a closer investigation of the network.
- Utilization—Measures the use of a particular resource over time. Utilization is usually expressed as a percentage of a resource's maximum operational capacity. It can be used to identify congestion or potential congestion throughout the network, as well as underutilized resources. Sudden jumps in resource utilization can indicate a fault condition.

With Cisco MGM, you can view performance management data sorted by:

- NE model
- Performance management type
- Performance management category

Note An alarm is generated for every piece of lost performance management data for the Cisco MGX8880, or Cisco MGX8850. A PM Lost Alarm 15 Min is generated when Cisco MGM is unable to collect performance management data for 15 minutes when the NE's performance management collection is enabled. If there are outstanding performance management 15 Min Retrieval Fail Alarms, these alarms are manually cleared and the performance management 15 Min Lost performance management Bucket Alarm is generated.

Note Make sure that the NE and the Cisco MGM server are synchronized. The NE generates performance management statistics at 15-minute intervals.

Cisco MGM also collects statistics which can be viewed using the Statistics Report. Statistics are numerical values derived from the contents of event counters that are located on the service modules in the switch. The counters record the number of occurrences for a particular network event. A single switch contains separate counters for hundreds of discrete network events.

The event counters on the service modules continue to accumulate the counts of network events whether or not the counters are ever read by an Operator or collected by the Cisco MGM station. If the content of a counter is read by you or by another application, the counter value is defined as a statistic. A single

statistic refers to a counter value for a single entity, for example, a line. If you enable statistics on an NE that has 100 lines, you are dealing with 100 entities that are associated with separate sets of counters. If you requested Cisco MGM to collect statistics for that NE, this will collect all the counter values for all the lines under that NE. If each line has 10 counters, this results in the collection of 1000 statistic values from that NE alone on every collection cycle.

Table 10-1 lists the types of statistics.

Table 10-1 Statistics Types

Name	Description
Summary Statistics	Specifies that the summary statistics are accessible through the command line interface (CLI), for example, the **dspchancnt** command on the Cisco MGX nodes. See Appendix D, "Statistics Summary." Summary statistics, which is also referred as real-time statistics, can also be accessed using SNMP through the Diagnostic Center. Summary or real-time statistics are not collected by Cisco MGM. **Note** The statistics name and statistics value for the real-time counters are also used for fault management. See Chapter 9, "Managing Faults," and Appendix E, "Real-Time Counters."
Interval Statistics	Provides a record of the number of events over the previous 15 minutes. Interval statistics are also known as history statistics, and are derived from the same event counters as summary statistics. **Note** Interval statistics are collected by Cisco MGM using FTP. The following subtypes are supported:

The following statistic examples are used:

- Performance monitoring at network and element levels
- Resource and capacity planning
- Threshold crossing alerts, for example, alarms
- Usage records for billing
- Traffic management

This section includes the following information:

- 10.2.1 Types of Report

10.2.1 Types of Report

Reports of the statistics data that are collected from the switch are viewed in the Statistics Report. Choose **Performance MG8880/8850 MG > Statistics Report**. Drag the NE to the right-hand pane to display the statistics. The following report functions are available in the drop down list:

- 10.2.1.1 Raw Data Report
- 10.2.1.2 Utilization Data Report
- 10.2.1.3 Performance Data Report

10.2.1.1 Raw Data Report

Raw Data Report selects and displays statistics data from the database:

- Lines
- Cards
- Ports
- PhysLine (physical lines)
- IMA
- Paths
- Connections
- Protocol
- PNNI Statistics

By using the Raw Data Report, you can:

- Select the statistics for the report and time period.
- Display statistics information by viewing the object description, for example, port, line, and card, time period for the statistics collected, statistics type, statistics value, and peak value.
- Generate a report for multiple objects, for example, ports of different cards with different statistics.
- Export data into `.csv` format file.
- Modify the report parameters and regenerate the report.
- List the endpoint for the selected port for the Raw Data Report on connections.

10.2.1.2 Utilization Data Report

Depending on the selected object, the Utilization Data Report lists the top utilized connections, and ports.

The Utilization Data Report supports Port Utilization Reports and VXSM Connection Reports.

You can use the utilization of an object to display a list of top utilized objects. The utilization for any object is calculated as a sum of percent bytes from the network and the percent bytes are transmitted to the network.

10.2.1.3 Performance Data Report

The Performance Data Report provides performance numbers for ports in a graphical format. Port Traffic Summary performance report types are supported.

All the performance numbers are given as an average over the time period. The following performance percentages are plotted:

- Total number of cells received
- Total number of cells transmitted
- Time in service

10.3 How Is Performance Data Collected?

Performance data collection is the process of collecting performance-related data from network devices and storing them in a database or data file. This information can then be used for locating, diagnosing, and correcting network problems to increase network reliability and effectiveness, and to ensure that fault management can be more than just handling emergencies. The data can also be used to increase the productivity of network users.

This section includes the following information:

- 10.3.1 Enabling or Disabling Performance Monitoring
- 10.3.2 Self Monitor Table
- 10.3.3 Activating or Deactivating Performance Monitoring

10.3.1 Enabling or Disabling Performance Monitoring

Performance monitoring is optional, but you must enable it if you want to collect performance parameters.

Note Performance management data collection is resource intensive in terms of CPU, disk space, and data communications network (DCN) utilization, so you should exercise proper planning and resource monitoring when you are using the performance management collection feature of Cisco MGM.

PM data collection for individual NEs can be enabled or disabled as follows:

Step 1 In the Domain Explorer window, select the NE node for which to stop or start PM data collection. The Network Element Properties sheet appears.

Step 2 In the PM Collection area of the Status tab of the Network Element Properties sheet, set the PM data collection state to 15 Min. Check this box to enable collection of PM data every 15 minutes. Uncheck to disable PM collection.

Step 3 Click **Save** to save changes to the database. The changes take effect immediately.

10.3.2 Self Monitor Table

When Cisco MGM comes close to or exceeds the limits of its performance, it might result in a reduction in the response time of the system. In this case, error messages are displayed to inform the user to restore normal operation. The Self Monitor Table allows users to monitor parameters that help in determining when Cisco MGM is close to the limit of its performance. See Figure 10-1.

Self monitoring can be used for CPU usage, memory usage, and disk usage. You can filter the Self Monitor Table on the collection time, and/or the parameter name.

To view the Self Monitor Table, at the top level of the Hierarchy pane in the Domain Explorer, choose **Administration > Self Monitor**. The Self Monitor Table appears, see Table 10-2 for details.

Figure 10-1 Self Monitor Table

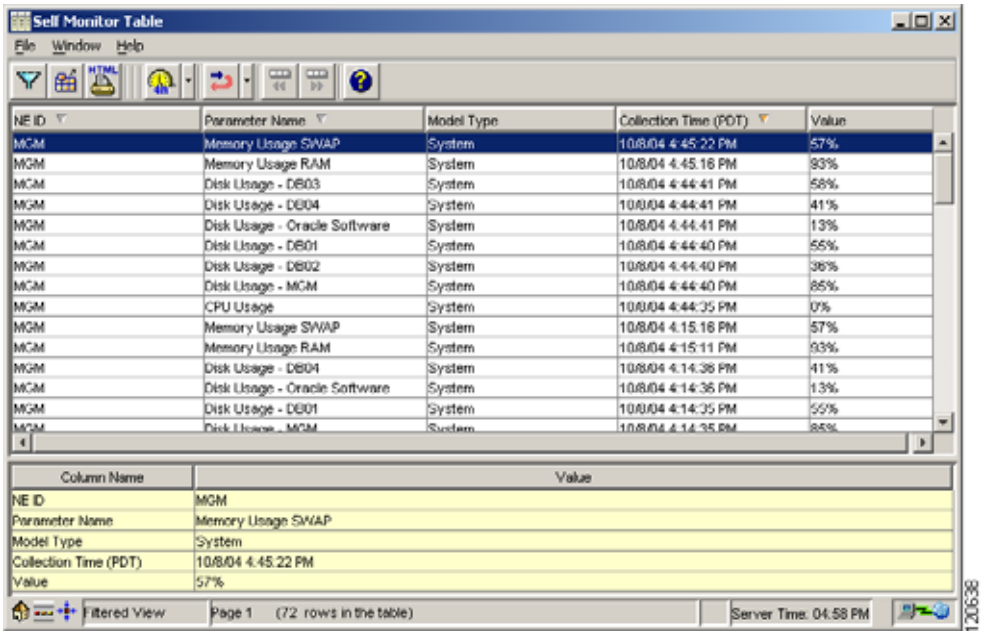


Table 10-2 Self Monitor Table Descriptions

Column Name	Description
NE ID	Displays the name of the EMS (MGM).
Parameter Name	Displays the name of the parameter. See the Alarm Configuration property sheet in the Control Panel for a list of monitored parameters.
Model Type	As NE model types are not applicable, “System” is displayed as the model type.
Collection Time	Displays the time in Greenwich Mean Time, a user-defined offset from Greenwich Mean Time (GMT), or local time, depending on what is specified in the User Preferences dialog box when Cisco MGM collected the parameter data. **Note** Cisco MGM automatically updates the time display for daylight saving time.
Value	Displays the value of the selected parameter.

10.3.2.1 Filtering the Self Monitor Table

The Self Monitor Table Filter allows you to filter the information displayed on the Self Monitor Table. It consists of the following tabs: Collection Time, Model Type, and Parameter Name. Table 10-3 describes the tabs within the Self Monitor Table Filter.

Table 10-3 Self Monitor Table Filter Descriptions

Tab	Description
Collection Time (time zone)	Allows you to filter data for a specified time period, ranging from the past hour to the past 180 days. Additionally, you can click the **User Specified** radio button to specify an exact filter starting and ending time by month, day, year, and hour. The time zone can be Greenwich Mean Time (GMT), a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box. If you want to filter data and the time period is not important, click **No Time Specified**. **Note** Cisco MGM automatically updates the time display for daylight saving time.
Model Type	As NE model types are not applicable, "System" is displayed as the model type.
Parameter Name	Allows you to move parameters back and forth between the list of available parameter names and selected parameter names. The filter runs on the parameters in the Selected Parameter Names list.

10.3.3 Activating or Deactivating Performance Monitoring

The PM Service property sheet allows users to activate or deactivate global performance management data collection and change NE performance management collection parameters.

To activate or deactivate PM Services for an NE model:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, expand **PM Service**.

Step 3 Select an NE type to open the PM Service property sheet. Choose **MGX 8880/8850 MG**.

Step 4 All the NEs monitored by the server stop collecting performance management data if the **Deactivate** button is clicked in the Status area. (Notice that the service status toggles to Not Active.) Click **Activate** to resume performance management data collection. The Activate or Deactivate button is in the PM Service property sheet of the MGX8850, and MGX8880 NEs.

Note If you need to activate or deactivate the PM Service again, go to the Service Monitor Table (choose **Administration > Service Monitor** in the Domain Explorer) to verify that the service has stopped or started before clicking the Activate or Deactivate button again.

Step 5 Ensure that the PM Service has started. In the Domain Explorer, choose **Administration > Service Monitor**. The Service Monitor Table should include an entry for the relevant PM Service.

10.4 Where Can I See the Performance Data?

Cisco MGM gives you the power to collect large amounts of performance data, so it is important that you be able to display only the required data. Data can be displayed in normal mode, where all performance data is collected and displayed in the PM data tables.

To optimize the usefulness of the performance data, you can filter it to view just the data for a set of NEs or a particular NE model, or to view data by performance category; for example, SONET.

PM data collection is every 15 minutes. You can also specify the PM data collection viewing interval. For example, you may choose to view the PM data that was collected every 15 minutes for the past four hours.

PM Services is activated by default. Refer to 10.3.3 Activating or Deactivating Performance Monitoring to activate PM Services in Cisco MGM. Before viewing PM data, make sure that PM data collection is enabled in Cisco MGM. See 10.3.1 Enabling or Disabling Performance Monitoring.

This section includes the following information:

- 10.4.1 Using the Statistics Report

10.4.1 Using the Statistics Report

To launch the Statistics Report, you can:

- In the Domain Explorer, choose **Performance > MGX 8880/8850 MG > Statistics Report**.
- Click the **Statistics Report** icon from the Diagnostic Center, Chassis View, or Configuration Center.
- Choose **Tools > Statistics Report** from the Diagnostic Center, Chassis View, or Configuration Center.
- Right-click an NE and choose **Tools > Statistics Report** from the Diagnostic Center, Chassis View, or Configuration Center.

The Statistics Report window has two panes:

- Report Parameters—Displays the name for each statistic along with the time period parameters in GMT, a user-defined offset from GMT, or local time, depending on what is specified in the User Preferences dialog box.

  Note Cisco MGM automatically updates the time display for daylight saving time.

- Report Data—Displays the parameters for the report data.

You can use the Statistics Report to view reports of statistics data that are collected from the switch.

Note RPM cards are not supported for the Statistics Report.

Table 10-4 lists the report types that are supported for each network element from the Hierarchy pane.

Table 10-4 Report Types for Each Network Element

Network Element	Report Types
Network	Supports the following report types: • Raw Data Report for cards, lines, ports, physical lines, protocol, and PNNI, in the network. • Performance Data Report for ports in the network. • Utilization Data Report for ports in the network.
Node	Supports the following report type: • Raw Data Report for cards, lines, ports, physical lines, protocol, and PNNI, on the node. • Performance Data Report for ports on the node. • Utilization Data Report for ports on the node.
Card	Supports the following report type: • Raw Data Report for all ports, protocol, and physical lines on the card.
Port	Supports the following report types: • Raw Data Report for ports and connections on the selected port. • Performance Data Report for connections on the selected port. • Utilization Data Report for connections on the selected port.
Line	Supports the following report types: • Raw Data Report for the line. If applicable, additional statistics are shown for physical lines.
Paths	Supports the Raw Data Report for paths.

10.5 What Types of Data Reports Are Available?

When performance data has been collected, the next step is to generate reports to present the data in the most useful form; for example, as a summary for an at-a-glance indication of the health of the network, or as an in-depth detailed report for analysis.

An at-a-glance report can provide quick information on any fault or failure on the network.

A more detailed report can be generated to help you understand traffic flows and how traffic changes over time.

Performance data stored in the database can be plotted using a maximum of three PM parameters on three consecutive graphs. The graphs can be printed using the PM table's Print option.

This section includes the following information:

- 10.5.1 Viewing Raw Data Reports
- 10.5.2 Viewing Utilization Data
- 10.5.3 Viewing Performance Data Reports
- 10.5.4 Exporting the Data Report

10.5.1 Viewing Raw Data Reports

The Raw Data Report Parameters pane in the Statistics Report displays the history statistics data for the selected statistics and the time period parameters. You can select the statistics from the different cards, for example, service lines, and physical lines, which are applicable for a line type.

These tasks are used to configure the Raw Data Reports:

- 10.5.1.1 Generating a Raw Data Report
- 10.5.1.2 Exporting the Raw Data Report
- 10.5.1.3 Generating a Raw Data Report for Connection Endpoints

For more information on the supported objects for each report type, see Table 10-4.

10.5.1.1 Generating a Raw Data Report

Multiple Raw Data Reports can be generated at the same time.

To generate the Raw Data Report at the node level:

Step 1 In the Statistics Report, move the node from the Hierarchy pane to the right hand pane.

Step 2 Choose **Raw Data Report** from the drop-down arrow. See Figure 10-2.

Step 3 Choose the Raw Data Report types from the drop-down arrow.

Step 4 Choose the Report Parameter type from the drop-down arrow.

Step 5 Check the check box to activate the selected statistics for the chosen report parameter. To activate all the statistics, check the **Select** check box.

Note If you choose a different report parameter type and did not uncheck the statistics from the previous report parameter, the previous checked statistics are also reported. You must uncheck all the statistics before you choose a different report parameter.

Step 6 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day). This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

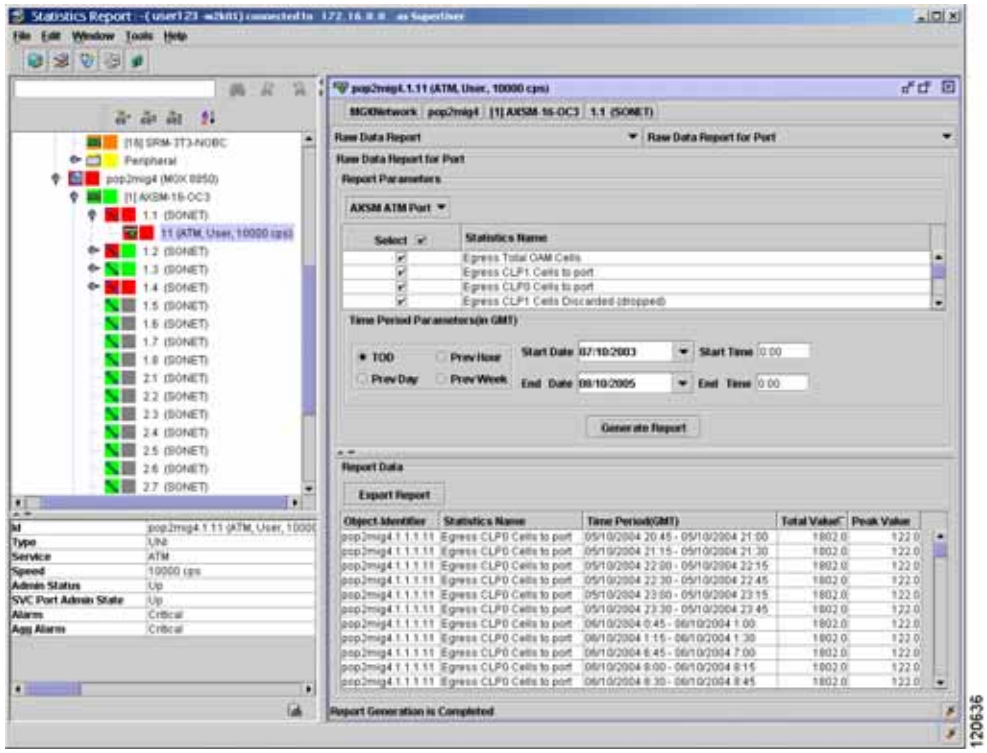
e. Enter the start time in **h:mm** in the **End Time** field.

Step 7 Click **Generate Report** to generate the Raw Data Report with the given parameters.

After receiving all the data, you can verify that the report is completely generated from the status bar. If no data is available, the status bar reports that the Raw Data Report has no data to report.

Note If you want to stop generating the Raw Data Report, click **Stop Report Generation**.

Figure 10-2 Statistics Report Window—Raw Data Report



10.5.1.2 Exporting the Raw Data Report

After generating the Raw Data Report, you can verify that the report is exported. To export the Raw Data Report at the node level, see the "10.5.4 Exporting the Data Report" section on page 10-21.

10.5.1.3 Generating a Raw Data Report for Connection Endpoints

You can also select a port in the Statistics Report and retrieve all the connections for the port. All the connection data reports are retrieved for the Raw Data Report, Utilization Data Report, and Performance Data Report at the same time.

To generate the Raw Data Report for connection endpoints:

Step 1 In the Domain Explorer, choose **Configuration > MGX 8880/8850 MG > Configuration Center** to open the Configuration Center.

Step 2 Click the **Connections** tab.

Step 3 Drag the node from the hierarchy to the right hand pane to display Connection Browser window.

Step 4 Click the **Connection List** tab, enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 5 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints for the node.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 6 Right-click the connection type from the list of connections and choose **Statistics Report**.

Step 7 Choose **Raw Data Report** from the drop-down arrow.

Step 8 Choose **Raw Data Report for Conn** from the drop-down arrow.

Step 9 Choose the Report Parameter Connection type from the drop-down arrow.

Step 10 Check the check box to activate the selected statistics. To activate all the statistics, check the **Select** check box.

Note If you choose a different report parameter type and did not uncheck the statistics from the previous report parameter, the previous checked statistics are also reported. You must uncheck all the statistics before you choose a different report parameter.

Step 11 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day). This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

e. Enter the start time in **h:mm** in the **End Time** field.

Step 12 Click **Generate Report** to generate connection end point reports with the given parameters.

After receiving all the data, you can verify that the connection endpoint list for the selected port is displayed.

If no data is available, the status bar reports that the Raw Data Report has no data to report.

Note If you want to stop generating the Raw Data Report, click **Stop Report Generation**.

10.5.2 Viewing Utilization Data

The Utilization Data Report verifies all ports, and connections. Utilization is based on percentage of total bits received in seconds and total bits transmitted in seconds. You specify the parameters listed that crosses the threshold value.

These tasks are used to configure Utilization Data Reports:

- 10.5.2.1 Calculating the Percent Utilization for Top Utilization Reports
- 10.5.2.2 Generating a Utilization Data Report
- 10.5.2.3 Exporting the Utilization Data Report
- 10.5.2.4 Generating a Utilization Data Report for Connection Endpoints

For more information on the supported objects for each report type, see Table 10-4.

10.5.2.1 Calculating the Percent Utilization for Top Utilization Reports

For percent utilization, the data is aggregated over a time period specified in the report.

Table 10-5 lists the calculations for the ports, and connections.

Table 10-5 Percent Utilization Calculations for Top Utilization Reports

Type	Calculation
Ports	
	Percent bytes received from the network (number of packets or cells) received per second or port speed) * 100
	Percent bytes transmitted to the network (number of packets or cells) transmitted per second or port speed) * 100
	Percent utilization of the port = percent bytes received from the network + percent bytes transmitted to the network

Table 10-6 lists the method conversion that are used to convert to bps.

Table 10-6 Method Conversion for Endpoints

Endpoint	Method Conversion
ATM	Convert cells received to bps by using the conversion formula, for example, each cell has a 48 B payload. bps = (number cells received / (bucket interval * 60)) * 48 * 8
Voice and Data	Convert packets to bits per second (each packet has 24 bytes) bps = ((number packets received / (bucket interval * 60)) * 24 * 8

10.5.2.2 Generating a Utilization Data Report

Multiple Utilization Data Reports can be generated at the same time.

To generate a Utilization Data Report at the node level:

Step 1 In the Statistics Report, move the node from the Hierarchy pane to the right hand pane.

Step 2 Choose **Utilization Data Report** from the drop-down arrow. See Figure 10-3.

Step 3 Choose **Utilization Report for Port** from the drop-down arrow.

Step 4 Enter the threshold percentage in the **Utilization Threshold Percentage** field.

Note The threshold is the minimum utilization percentage after which you want to report, for example, a 90% threshold report details data of >90%.

Step 5 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day) This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

e. Enter the start time in **h:mm** in the **End Time** field.

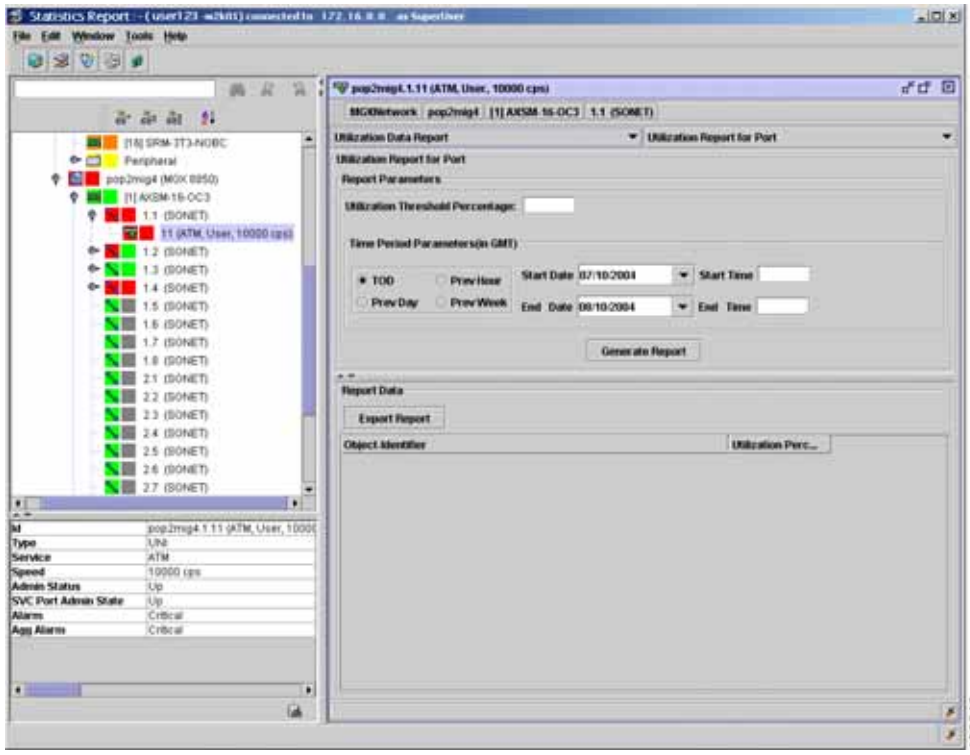
Step 6 Click **Generate Report** to generate the Utilization Data Report for the threshold percentage.

Note If the Utilization Data Report lists more than 100 results, you must change the parameters and narrow the query.

After receiving all the data, you can verify the data by using the formula conversions (see Table 10-5 and Table 10-6). If no data is available, the status bar reports that the Utilization Data Report has no data to report.

Note If you want to stop generating the Utilization Data Report, click **Stop Report Generation**.

Figure 10-3 Statistics Report Window—Utilization Report



10.5.2.3 Exporting the Utilization Data Report

After generating the Utilization Data Report, you can verify that the report is exported. To export the Utilization Data Report at the node level, see the "10.5.4 Exporting the Data Report" section on page 10-21.

10.5.2.4 Generating a Utilization Data Report for Connection Endpoints

You can also select a port in the Statistics Report and retrieve all the connections for the port. All the connection data reports are retrieved for the Raw Data Report, Utilization Data Report, and Performance Data Report at the same time.

To generate the Utilization Data Report for connection endpoints:

Step 1 In the Domain Explorer, click the node and choose **Configuration > MGX 8880/8850 MG >Configuration Center**.

Step 2 In Configuration Center, click the **Connections** tab.

Step 3 Drag the node to the right hand pane to display the Connection Browser window. Click the **Connection List** tab.

Step 4 Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 5 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints for the node.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 6 Right-click the connection type from the list of connections and choose **Statistics Report**.

Step 7 Choose **Utilization Data Report** from the drop-down arrow.

The Utilization Data Report Connections window is displayed.

Step 8 Choose **Utilization Data Report** from the drop-down arrow:

Step 9 Choose **Utilization Report for Conn** from the drop-down arrow.

Step 10 Enter the threshold percentage in the **Utilization Threshold Percentage** field.

Step 11 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day) This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

e. Enter the start time in **h:mm** in the **End Time** field.

Step 12 Click **Generate Report** to generate the Utilization Data Report for the threshold percentage.

Note If the Utilization Data Report lists more than 100 results, you must change the parameters and narrow the query.

The Utilization Data Report shows the connections that have crossed the specified threshold. After receiving all the data, you can verify the data by using the formula conversions (see Table 10-5 and Table 10-6). If no data is available, the status bar reports that the Utilization Data Report has no data to report.

10.5.3 Viewing Performance Data Reports

Table 10-7 lists the performance data information in a given time period for the selected object.

Table 10-7 Performance Data Report Information

Object Type	Description
Ports	Displays both receive percentage and transmit percentage.
Connections	Displays both local and remote endpoints for receive percentage and transmit percentage along with service in sec.

For more information on the supported objects for each report type, see Table 10-4.

These tasks are used to configure Performance Data Reports:

- 10.5.3.1 Calculating the Statistics Percentages for the Performance Data Report
- 10.5.3.2 Generating the Performance Data Report for a Port
- 10.5.3.3 Displaying Performance Data Report for a Port
- 10.5.3.4 Generating the Performance Data Report for Connections
- 10.5.3.5 Displaying Performance Data Report for Connections

10.5.3.1 Calculating the Statistics Percentages for the Performance Data Report

You can calculate the statistics percentages for the Performance Data Report.

Table 10-8 lists the statistics for the port performance.

Table 10-8 Port Performance Statistics

Port Type	Percentage Bytes Received (Stats ID)	Percentage Bytes Transmitted (Stats ID)
Cisco MGX 8880 (VXSM)	ING CLP0 tramsmitted (0) + ING CLP1 transmitted (1)	EGR CLP0 tramsmitted(6) + EGR CLP1 transmitted (7)
Cisco MGX 8850 (PXM45) ATM (AXSM)	Egress CLP0 Cells From backplane (6) + Egress CLP1 Cells From backplane (7)	Ingress CLP0 Cells to backplane (4) + Ingress CLP1 Cells to backplane (5)
Cisco MGX 8850 (PXM45) ATM (AXSM-E)	CLP0 cells transmitted (Ingress) (61) + CLP1 cells transmitted (Ingress) (62)	CLP0 cells transmitted(0) + CLP1 cells transmitted(1)
Cisco MGX 8850 (PXM45)	Bytes Received (1)	Bytes Transmitted (10)

Table 10-9 lists the statistics for connection performance.

Table 10-9 Connection Performance Statistics

Endpoint Type	Percentage Bytes Received (Stats ID)	Percentage Bytes Transmitted (Stats ID)	Percentage of Time in Service (Stats ID)
Cisco MGX 8880 (VXSM)	No. ingress cells to network (0)	No. egress cells to network (5)	—
Cisco MGX 8880 (VISM-PR)	Total num cells recieved (1)	Total num cells Tx (0)	—
Cisco MGX 8850 (PXM45) AXSM	Ingress CLP0 Cells From Port + Ingress CLP1 Cells From Port) - (Ingress CLP0+1 cells discarded)	Egress CLP0 Cells to Port(7) + Egress CLP1 Cells to Port(8)	—
Cisco MGX 8850 (PXM45) AXSM-E	CLP0 cells from port (5)+ CLP1 cells from port (6)	CLP1 cells to the port(19) + CLP1 cells to the port (20)	—

10.5.3.2 Generating the Performance Data Report for a Port

Multiple Performance Data Reports can be generated at the same time.

To generate the Performance Data Report at the port level:

Step 1 In the Statistics Report Tool, drag the port from the Hierarchy pane to the right hand pane.

Step 2 Choose **Performance Data Report** from the drop-down arrow. See Figure 10-4.

Step 3 Choose **Performance Data Report for Port** from the drop-down arrow.

Step 4 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day) This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

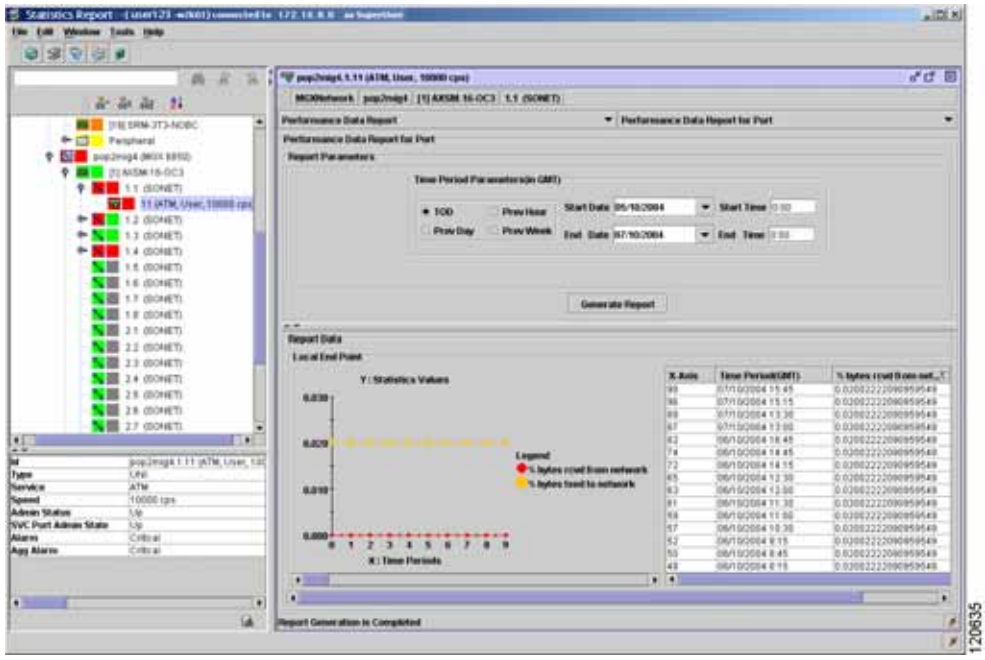
d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

e. Enter the start time in **h:mm** in the **End Time** field.

Step 5 Click **Generate Report** to generate the Performance Data Report for the port. If no data is available, the status bar reports that the Performance Data Report has no data to report.

Note I f you want to stop generating the Performance Data Report, click **Stop Report Generation**.

Figure 10-4 Statistics Report Window—Performance Data Report



10.5.3.3 Displaying Performance Data Report for a Port

After you finished generating the Performance Data Report (see 10.5.3.2 Generating the Performance Data Report for a Port), you must ensure that the graphical information is correct. For example, you must verify that the report shows the correct port object identifier according to the entity label specifications.

To display the graphical representation of the Performance Data Report at the port level:

Step 1 Verify the performance data information by using the formulas. For information about the formulas for a port, see Table 10-8.

The performance data information for the port is displayed.

Step 2 Click **Close** to close the report summary.

10.5.3.4 Generating the Performance Data Report for Connections

You can also select a port in the Statistics Report and retrieve all the connections for the port. All the connection data reports are retrieved for the Raw Data Report, Utilization Data Report, and Performance Data Report at the same time.

To generate the Performance Data Report for connection endpoints:

Step 1 In Domain Explorer, select the node and choose **Configuration > MGX 8880/8850 MG > Configuration Center**.

Step 2 In Configuration Center, click the **Connections** tab.

Step 3 Drag the node to the right hand pane to display the Connection Browser window.

Step 4 Click the **Connection List** tab.

Step 5 Enter the number of connections you want to retrieve in the **Connection Count to be retrieved** field. To retrieve all the connections, enter *****.

Step 6 Click **Get** to retrieve the connections. For example, you can retrieve connections for both local and remote endpoints for the node.

The Connection Browser window appears with the number of connections matching the filtering criteria. A list of connections that have either local or remote endpoints are displayed in the connection list.

Step 7 Right-click the connection type from the list of connections and choose **Statistics Report**. The Statistics Report opens.

Step 8 Choose **Performance Data Report** from the drop-down arrow.

Step 9 Choose **Performance Data Report for Conn** from the drop-down arrow.

Step 10 From the **Time Period Parameters** area:

a. Choose one of the following time period schedules:
   - **TOD** (Time of Day) This value is specified by the user.
   - **Prev Hour**
   - **Prev Day**
   - **Prev Week**

b. Enter the start date in **dd/mm/yyyy** in the **Start Date** field.

c. Enter the start time in **h:mm** in the **Start Time** field.

d. Enter the end date in **dd/mm/yyyy** in the **End Date** field.

e. Enter the start time in **h:mm** in the **End Time** field.

Step 11 Click **Select Connection(s)** to view the available connections.

Step 12 Select the connection.

Step 13 Click **Next**.

Step 14 Click **Generate Report** to generate the report for connection endpoints.

Note If you want to stop generating the Performance Data Report, click **Stop Report Generation**.

10.5.3.5 Displaying Performance Data Report for Connections

After you finished generating the Performance Data Report, you must ensure that the report displays one chart for the connection local endpoint performance data and the other chart for the connection remote endpoint performance data.

To display the graphical representation of the Performance Data Report for connection endpoints:

Step 1 Verify the performance data information by using the formulas. For information about the formulas for a port, see Table 10-8.

The performance data information for connection endpoints is displayed.

Step 2 Click **Close** to close the report summary.

10.5.4 Exporting the Data Report

After generating the Data Report, you can verify that the report is exported.

To export the Data Report at the node level:

Step 1 After generating a raw data report, click **Export Report** to export the report data.

Step 2 Choose one of the following radio buttons in the **Format** area:

- **CSV**—Specifies the format of the file that is defined as a comma-separated value (CSV).
- **Tab**—Specifies the format of the file that is tab separated.

Step 3 Click **Browse** to select the filename and location to save the results of the query.

Step 4 Click **Export** to export the report data to the file.

10.6 How Is Performance Data Stored?

Performance data is stored in the Oracle9i database.

Regular collection of performance data for all traffic-bearing facilities within the network can use up a lot of space in the database. In order to conserve disk space, you can enable and disable the collection of performance data on a per NE basis, as well as select the performance parameters that are of interest.

You can also choose to prune the database. Cisco MGM automatically performs daily pruning of all PM data, FM data, audit log data, audit trail data, and Error Log data older than the specified retention period. To configure automatic database pruning:

Step 1 In the Domain Explorer window, choose **Administration > Control Panel**.

Step 2 In the Control Panel window, click **Database Properties** to open the Database Properties sheet.

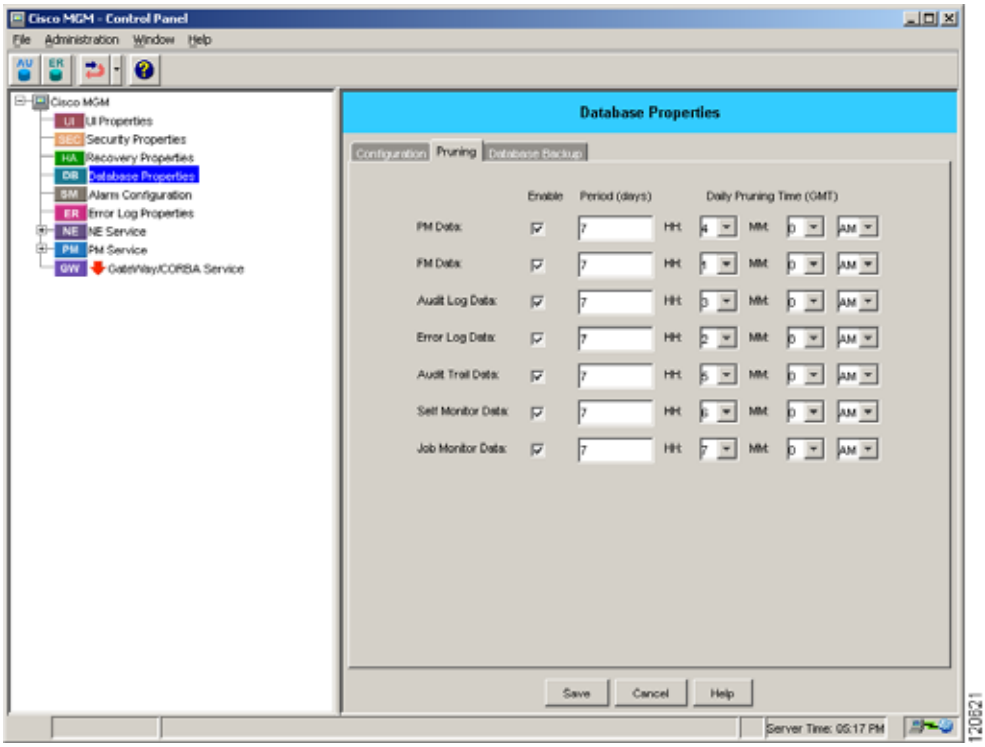
Step 3 In the Database Properties sheet, click the **Pruning** tab. See Figure 10-5.

Choose PM Data. This specifies the number of days to save PM data before Cisco MGM runs the database pruning script. You can save from 1 to 1000 days of data. The default value is 7 days. You can also specify the time to prune the PM data by choosing the hour and the minute from the HH, MM, and AM/PM fields. Minutes are listed in 5-minute intervals. Click **Enable** to activate PM data pruning.

Step 4 After making the selection, click **Save**. Changes take effect immediately.

You can also run database pruning scripts to prune Cisco MGM data from the Oracle database at any given time. Pruning scripts allows users to prune all PM data. See "5.1.4 Pruning the Database" section on page 5-13.

Figure 10-5 Database Properties—Pruning Tab



10.6.1 Importing and Exporting Data to and from the Oracle Database

You can use the Oracle Export utility to write data from an Oracle database to an operating system file in binary format. The file is stored outside the database and read to another Oracle database by using the Import utility. For more information about using Oracle Import and Export utilities, refer to the *Oracle9i Utilities* document. Alternatively, use the Oracle Enterprise Manager to import and export data.

The Export utility provides a simple way to transfer data objects between Oracle databases. The Export utility extracts the object definitions and table data from an Oracle database and stores them in an Oracle binary-format export dump file located on disk or on tape.

The export dump file is sent by using FTP—or, if on tape, physically transported—to a different site. By using the Import utility, the export dump file is transferred between databases that reside on machines not connected through a network.

Note Only the Oracle Import utility can read export dump files.

Managing Inventory

This chapter describes inventory management, and how to use Cisco MGM to provide the required information. This chapter contains the following sections:

- 11.1 What is Inventory Management?

Cisco MGM provides two levels of inventory reports:

- A complete list of all the NEs that belong to a specific group or to the entire domain (see 11.2 Domain NE Tables.)
- A detailed list of cards and modules installed on the NEs (see 11.3 Equipment Inventory Tables.)

11.1 What is Inventory Management?

Managing inventory involves maintaining a record of all of the NE resources installed in the network to support the provisioning of services. It should include collecting information about locations, quantities of equipment, model numbers, serial numbers, versions, installation dates and so on.

Inventory management is one of the fundamental network management functions. When forecasting service growth or even attempting to provision a new service, it is necessary to know the current network inventory. Can the existing inventory support the forecast growth or new service request, or must additional equipment be ordered and installed onsite? Can your hardware support a new software release? You will need to check the type and revision of hardware to determine the answer. Has a recall been issued by the vendor for a certain hardware revision of a board? Are you affected? You will need to check the inventory again.

Cisco MGM allows you to add NEs, and it discovers the details about the NE itself and the physical inventory. Cisco MGM remains automatically synchronized with changes relating to inventory that may occur in the network. All inventory information is stored in the Cisco MGM (Oracle) database and is available at any time from the Cisco MGM database.

Inventory management includes the discovery of the NEs from the Element Management System (EMS), and ongoing synchronization with the NEs. It also includes the ability to provide the inventory to a higher level network management system (NMS) through a northbound interface.

Cisco MGM can quickly capture, display, and store an inventory of the NEs on your network. It allows you to view information about the NEs, installed software, and software licenses. Cisco MGM also allows you to edit the inventory information for the NEs on your network.

You can add Not Managed/Other Vendor NEs in the Domain Explorer through the Add New NE wizard, and the NE is then represented in the Network Map.

Cisco MGM allows you to export inventory reports to a flat text file with a user specified delimiter character. This file can then be easily imported into a spreadsheet application for further analysis.

11.2 Domain NE Tables

The Domain NE tables displays an inventory of all the NEs in the Cisco MGM domain or group selected. Based on your selection criteria, the Domain NE Table tells you which NEs are in or out of service, available or unavailable, and so on.

11.2.1 Viewing a Domain NE Table

The Domain NE Table shows the summary information of the NEs in the domain or group.

Step 1 In the Domain Explorer, select the domain or an NE or group.

Step 2 Choose **File > Domain NE Table**.

Note The Dashboard displays an NE counter icon. This counter displays the total number of NEs in the domain. Click the counter to open the Domain NE Table, which provides an inventory of NEs within the selected management domain.

The Domain NE Table displays an inventory of all the NEs in the domain or group selected. Based on your selection criteria, the Domain NE Table shows which NEs are in or out of service, available or unavailable, and so on.

Table 11-1 provides descriptions of the information displayed in the table.

Figure 11-1 Domain NE Table

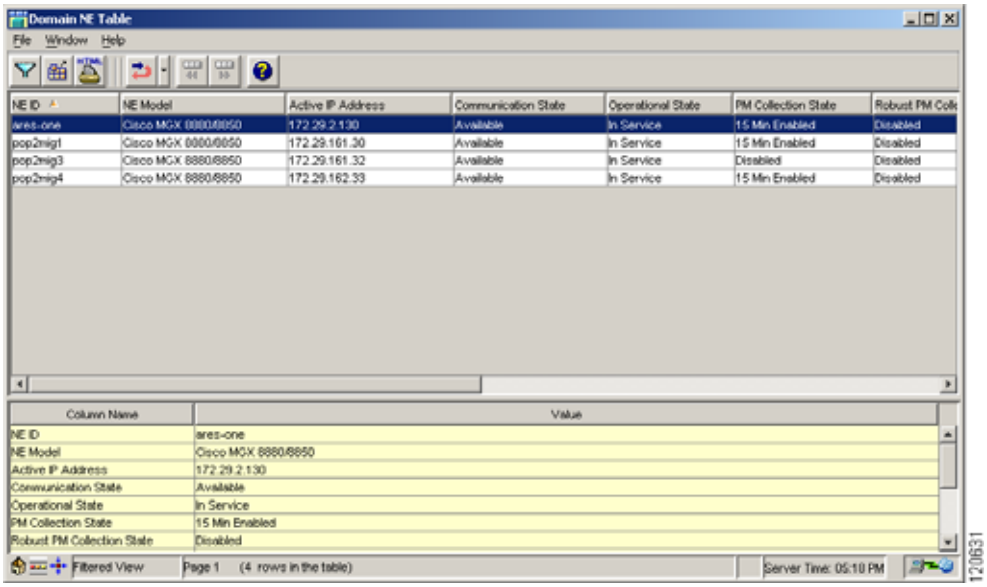


Table 11-1 Field Descriptions for the Domain NE Table

Field	Description
NE ID	Displays the name of the selected NE.
NE Model	Displays the NE model:Cisco MGX 8880/8850
Active IP Address	Displays the active IP address of the selected NE.
Communication State	Displays the connectivity state between Cisco MGM and the selected NE (either Available or Unavailable).
Operational State	Displays the current operational state of the system: In Service, Under Maintenance, or Out of Service.
PM Collection State	Indicates whether performance monitoring collection is enabled or disabled. Values are 15 Min Enabled and 15 Min Disabled. You can configure the PM collection state in the **Domain Explorer > NE Properties sheet > Status** tab.
Version	Displays the NE software version that is running.
NE Type	Displays the type of NE.
Location Name	Displays the geographic location of the NE.
Description	Displays any information that a user entered to describe the selected NE.

11.2.2 Filtering Results in a Domain NE Table

Step 1 In the Domain Explorer Hierarchy pane, select a domain or an NE or group.

Step 2 Choose **File > Domain NE Table**. The Domain NE Table appears.

Step 3 Choose **File > Filter** or click the **Filter** tool. The Domain NE Table Filter dialog box appears.

Step 4 In the Domain NE Table Filter dialog box specify the criteria to display the results in the Domain NE Table. Table 11-2 provides descriptions of the fields displayed in the window.

Step 5 Click **OK**. The filtered data is displayed in the Domain NE Table.

Table 11-2 Domain NE Table Filter Dialog Box Descriptions

Tab	Field	Description
NE ID	Available NE ID/Selected NE ID	Displays the list of available NE IDs. Click **Add** and **Remove** to move NE IDs to and from the Selected NE ID list.
Inventory	Communication State	Allows you to filter NEs according to their communication state (Unavailable or Available).
	Operational State	Allows you to filter NEs according to their operational state (In Service, Out of Service, or Under Maintenance).
	PM Collection State	Allows you to filter NEs according to their PM collection state (Enabled, 15 Min Collection, Disabled).
	GNE	Allows you to filter domain inventory data based on GNE IDs. You can select <ALL> to filter all GNE IDs, or you can choose a particular GNE ID from the pull-down menu.
NP ID	Available Network Partitions/Selected Network Partitions	Allows you to filter domain inventory data based on network partition. Use the **Add** and **Remove** buttons to move network partitions to and from the Selected Network Partitions list.

11.3 Equipment Inventory Tables

The Equipment Inventory Table displays a complete inventory of the components of the selected NE or of the NEs in a group.

11.3.1 Viewing an Equipment Inventory Table

The Equipment Inventory Tables display a complete inventory of the components of the selected NE or of the NEs in a selected group.

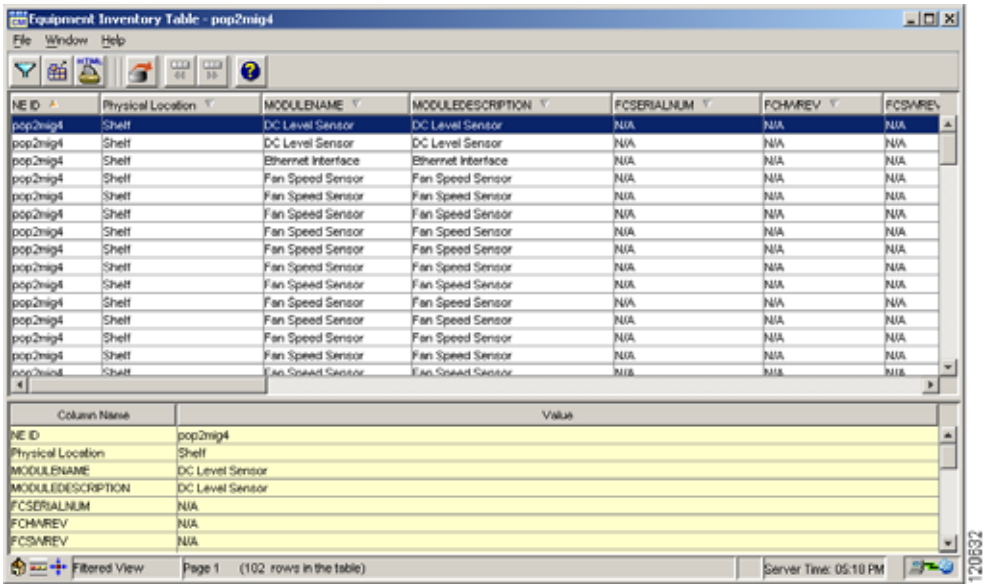
Step 1 In the Domain Explorer, select the NE or group for which you want to view inventory data, and choose **Configuration > MGX8880/8850 MG > Equipment Inventory Table**. The Equipment Inventory Table for the selected NE model appears. See Figure 11-2.

The Equipment Inventory Table displays a complete list of the Cisco MGX 8880/8850 system inventory. Table 11-3 provides descriptions.

Table 11-3 Equipment Inventory Table Descriptions—Cisco MGX8880/8850

Column	Description
NE ID	Displays the name of the selected NE.
Physical Location	Displays the name of the location where the NE is installed.
MODULENAME	Displays the name of the module.
MODULEDESCRIPTION	Displays any information that was previously entered to describe the selected NE.
FCSERIALNUM	Displays the serial number of the front card.
FCHWREV	Specifies the hardware revision number of the front card.
FCSWREV	Specifies the software revision number of the front card.
FCRESETREASON	Displays the reason for resetting the front card.
MODULESTATE	Displays the state of the module.
BCNAME	Displays the name of the back card.
BCSERIALNUM	Displays the serial number of the back card.
BCHWREV	Specifies the hardware revision number of the back card.
BCSTATE	Displays the state of the back card.
SECBCNAME	Displays the name of the secondary back card.
SECBCSERIALNUM	Displays the serial number of the secondary back card.
SECBCHWREV	Specifies the hardware revision number of the secondary back card.
SECBCSTATE	Displays the state of the secondary back card.
SYNCMODE	Specifies the synchronization mode.
LOGICALSLOT	Specifies the logical slot.
SCTID	Displays the ID of the Service Class Template file identifier
SCTVERSION	Displays the version of the Service Class Template file identifier
UNITNUM	Displays the number of the unit.
GROUPNUM	Displays the group number
NEDBACCESSID	Displays the database access ID
IFINDEX	Displays the ID index.

Figure 11-2 Equipment Inventory Table



Managing CORBA Interfaces

This chapter contains the following information:

- 12.1 What is Cisco MGM GateWay/CORBA?
- 12.2 Using a Static CORBA Listener Port on the Cisco MGM Server
- 12.3 Configuring the CORBA Timeout

Note Cisco MGM GateWay/CORBA is only mentioned briefly here. For more information about Cisco MGM GateWay/CORBA, including how to enable username and password encryption, set the heartbeat event, and create OSS clients, refer to the *Cisco Media Gateway Manager 5.0 GateWay/CORBA User Guide and Programmer Manual*.

12.1 What is Cisco MGM GateWay/CORBA?

Cisco MGM GateWay is an architectural component that provides northbound EMS-to-NMS interface mediation. Cisco MGM GateWay allows service providers to integrate Cisco MGM with their OSSs by using open standard interfaces.

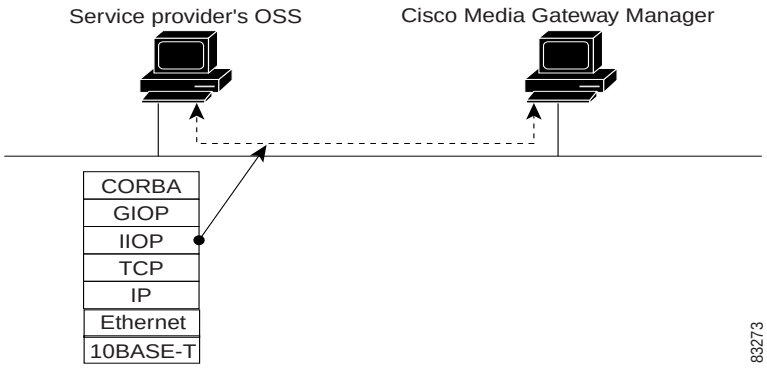
Note Cisco offers the CORBA (sold separately) option for Cisco MGM GateWay.

The Cisco MGM GateWay/CORBA option is a CORBA-based interface that provides higher-layer management systems with fault, and inventory information for each NE that Cisco MGM manages. The Cisco MGM GateWay/CORBA option is based on the TeleManagement Forum (TMF) standards for the NMS-to-EMS interface. Cisco MGM GateWay/CORBA supports up to eight simultaneous sessions with higher-layer management systems.

Note For more information about Cisco MGM GateWay/CORBA, including how to enable username and password encryption, set the Cisco MGM GateWay/CORBA heartbeat event, and create OSS clients for Cisco MGM GateWay/CORBA, refer to the *Cisco Media Gateway Manager GateWay/CORBA User Guide and Programmer Manual*.

Figure 12-1 illustrates the Cisco MGM GateWay/CORBA communications architecture within a service provider's OSS environment.

Figure 12-1 Cisco MGM GateWay/CORBA Communications Architecture



Cisco MGM GateWay/CORBA is based on the following TMF standards:

- TMF513 v2.0 (October 2001): Multi-Technology Network Management Business Agreement
- TMF608 v2.0 (October 2001): Multi-Technology Network Management Information Agreement
- TMF814 v2.0 (October 2001): Multi-Technology Network Management Solution Set

12.1.1 Viewing the Cisco MGM GateWay/CORBA Properties Pane

Use the GateWay/CORBA Service Properties pane to stop, start, or configure Cisco MGM GateWay/CORBA service parameters. To view the Cisco MGM GateWay/CORBA Properties pane, from the Domain Explorer window, choose **Administration > Control Panel**, then choose **GateWay/CORBA Service** from the hierarchy pane at left. The pane contains two tabs, Global and OSS Clients.

12.1.1.1 Global Tab

Use the Global tab to start and stop Cisco MGM GateWay/CORBA service.

Table 12-1 Field Descriptions for GateWay/CORBA Service—Global Tab

Field	Description
Service Status	Displays the current status of the service: Active, Not Active, or Not Installed.
Service Control	Allows you to stop or start a process. Notice that the Service Control button toggles between Stop and Start, and the Service Status field changes accordingly. This field is not available if the Service Status is Not Installed.
Enable Encryption for Username and Password	When checked, usernames and passwords are transmitted between the EMS server and the OSS in encrypted format. The maximum encryption length is 53 bytes. If this check box is unchecked, Cisco MGM GateWay/CORBA usernames and passwords are transmitted without encryption. By default, encryption is disabled at installation.

Table 12-1 Field Descriptions for GateWay/CORBA Service—Global Tab (continued)

Field	Description
Heartbeat for Notification Channel	Notifies the OSS if a failure in the notification service has occurred. The heartbeat is measured in minutes ranging from 0 to 1440 minutes. A zero value implies that the heartbeat is disabled.
Error Level	Allows you to select the error level for the Cisco MGM GateWay/CORBA service. Error levels are: • Critical • Major • Minor • Informational • Debug • Trace

12.1.1.2 OSS Clients Tab

Use the OSS Clients tab to view current Operations Support System (OSS) client configuration information or to add a new OSS client. The OSS Clients tab is not displayed if the Service Status is Not Installed.

Table 12-2 Field Descriptions for GateWay/CORBA Service—OSS Clients Tab

Field	Description
OSS Profile Name	The name of the OSS profile.
Password	The password that the OSS client uses to log into the Cisco MGM server. If you are adding a new OSS client, the password must contain 1 to 53 characters, including one special character (, . ; % & ! + #), at least two letters (A - Z, a - z), and at least one number (0 - 9).
Confirm Password	The reconfirmed password.
OSS IP Address	The OSS IP address.
Delete button	Deletes an OSS profile from the Cisco MGM database. If a profile is deleted, the OSS using this profile cannot connect to Cisco MGM. If the OSS is connected to Cisco MGM when the profile is deleted, Cisco MGM will not terminate the OSS session.

12.1.2 Viewing the Cisco MGM GateWay/CORBA Client Configuration Table

The Cisco MGM GateWay/CORBA Client Configuration Table displays information about Operations Support System (OSS) CORBA client properties. To view the Cisco MGM GateWay/CORBA Client Configuration table, from the Domain Explorer window, choose **Administration > Control Panel**, then choose **Administration > Cisco MGM GW/CORBA Client Configuration Table**.

Table 12-3 Field Descriptions for Cisco MGM GateWay/CORBA Client Configuration Table

Column Name	Description
OSS Name	Displays the name of the selected OSS client.
IP Address	Displays the IP address of the OSS client.

12.2 Using a Static CORBA Listener Port on the Cisco MGM Server

To use a static CORBA listener port on the Cisco MGM server, proceed as follows.

Step 1 Log into the Cisco MGM server workstation as the root user.

Step 2 Change the directory to /opt/CiscoMGMServer/bin.

Note The default directory /opt/CiscoMGMServer may have been changed during installation of the Cisco MGM server.

Step 3 Edit the jne454.sh file by inserting a new line before the -Xbootclasspath line:

```
-Dong.orb.iioplistenerport=Port Number \
```

For example, if the port number is 5555, enter:

```
-Dong.orb.iioplistenerport=5555 \
```

Step 4 Start the Cisco MGM server.

12.3 Configuring the CORBA Timeout

The CORBA timeout determines the number of seconds that the Cisco MGM server has to process a CORBA call and return it to the Cisco MGM client. If the Cisco MGM server does not return a response in time, CORBA automatically times out.

Step 1 Open the ems-client.cfg file.

By default, the ems-client.cfg file is located in the C:\Cisco\MediaGatewayManagerClient\config directory for Windows platforms and in the /opt/CiscoMGMClient/config directory for Sun Solaris platforms.

Step 2 Set the CORBA_Call_Timeout_Seconds parameter to the desired value. The default timeout is 120 seconds; the recommended range is 120 to 300 seconds.

Note If the NE is busy or if the Cisco MGM server is processing many requests, you might need to increase the CORBA timeout parameter accordingly.

Step 3 Save and close the ems-client.cfg file.

Icons and Menus

This appendix describes the icons and menus used in Cisco MGM, and contains the following sections:

- A.1 Launching Applications
- A.2 Toolbar Options
- A.3 Menu Options
- A.4 Hierarchy Pane Icons
- A.5 Inspector View Icons
- A.6 Network Map Icons

A.1 Launching Applications

Applications in Cisco MGM can be launched from the toolbar and dashboard, as well as from menu options. Table A-1 list the icons.

Table A-1 Cisco MGM Applications Icons

Application	Icon
Alarm Browser	
Chassis View	
Configuration Center	
Diagnostic Center	

Table A-1 Cisco MGM Applications Icons (continued)

Application	Icon
Domain Explorer	
EMS Alarm Browser	
Statistics Report	

A.2 Toolbar Options

The various Cisco MGM toolbar tools are described in .

Table A-2 Toolbar Tools Description

Tool	Item	Description
	Acknowledge Alarms	Acknowledge the selected alarm(s). Click again to unacknowledge the selected alarm(s). To enable alarm unacknowledgement, go to **Control Panel > UI Properties**.
	Acknowledge All Alarms	Acknowledges all alarms. Click again to unacknowledge all alarms.
	Add Network Element(s)	Opens the Add New Network Element wizard, which allows you to add a new NE or add several new NEs at once.
	Alarm Browser	Opens the Alarm Browser window.
	Alarm Log	Opens the Alarm Log window.
	Audit Log	Opens the Audit Log window.

Table A-2 Toolbar Tools Description (continued)

Tool	Item	Description
	Cancel Job	Allows you to cancel a scheduled job. Cancel is enabled only for jobs with a Queued status.
	Cancel Task	Allows you to cancel a task.
	Clear Selected Alarm(s)	Clear selected alarms. A message displays, informing you that only PM failed and PM lost alarms on NEs in your domain will be cleared.
	Collapse	Collapses the management domain or group to hide all groups or NEs in that management domain or group.
	Commit	The Commit operation makes the standby software version the active version if it is a later version than the active software.
	Copy	Copies the selected NE to the clipboard. The selected NE now appears in italics.
	Create a New User	Opens the Create New Cisco MGM User wizard.
	Create a New User Profile	Opens the Create New User Profile wizard.
	Cut	Copies the selected NE to the clipboard. The selected item now appears in italics. The NE is not removed from its current location until the Paste action is performed.
	Delete	Deletes the selected item. Deletes the selected user.
	Duplicate User Profile	Opens the Create Duplicate Profile window, which allows you to duplicate an existing Cisco MGM user profile.

Table A-2 Toolbar Tools Description (continued)

Tool	Item	Description
	Enable Drag	Enables drag and drop functionality for all nodes within the Network Map window.
	Enable Offview	Enables the display of off-view icons within the Network Map window.
	Error Log	Opens the Error Log window.
	Expand	Expands the management domain or group to display all groups or NEs in that management domain or group.
	Export Data To File	Opens the Export dialog box.Exports data, such as alarms, events, and error logs. Data is exported in comma-separated values (CSV) or tab separated values (TSV) formats.
	Filter	Opens a filter dialog box, which allows you to filter for information found in the table or window. **Note** Use the percent sign (%) as a wildcard character for filtering on substrings.
 	Filter Time Period	Allows you to filter using time as a parameter. As the default, Cisco MGM displays alarm and event information that occurred during the last four hours. To quickly filter the time period, select the Filter Time Period (4h) tool. You can change the default time period by using the User Preferences dialog box. The icon displayed in the tool bar changes according to the time period selected.
	Generate HTML Report	Allows you to generate an HTML report based on the data in the table. You can generate a report for selected rows or for all rows. After you have made your selection, the browser window appears with the HTML report. Use your browser's Print option to print the HTML report.
	Help	Displays online help for the current window.
	Hide Acknowledged Alarms	Hides all alarms that have been acknowledged.

Table A-2 Toolbar Tools Description (continued)

Tool	Item	Description
	Hide Cleared Alarms	Hides all alarms that have been cleared.
	Launch User Profiles Table	Opens the Cisco MGM User Profiles Table.
	Log Out User	Logs out the selected user from the Cisco MGM application.
	Logged in Cisco MGM Users	Opens the Logged In Cisco MGM Users Table, which lists the Cisco MGM users who are currently logged into the Cisco MGM application.
	Modify User	Opens the Modify User wizard.
	Modify User Profile Properties	Opens the Modify Cisco MGM User Profile Properties wizard.
	Network Map	Opens the Network Map window for the selected node.
	New Group	Opens the New Group dialog box. From here, you can add a new group, give the group a name, specify the group's geographic location, and provide a brief description of the group.
	Page Back	Moves the table backward by one page if there is more than one page of data.
	Page Forward	Moves the table forward by one page if there is more than one page of data.
	Parent (also Show Parent Network Map)	If the Network Map is open to a specific NE, clicking Parent or Show Parent Network Map shifts the view back to the main Network Map view.

Table A-2 Toolbar Tools Description (continued)

Tool	Item	Description
	Paste	Pastes the NE on the clipboard into the selected group.
	Print Graph	Prints the graphical display.
	Refresh Data	Refreshes all data being displayed by Cisco MGM. There are two icons, and both refresh data from either the server or the database. The Refresh Data icon with blue and red arrow (as seen in Circuit Table) flashes when updates are available. This icon has two modes: manual refresh and autorefresh. The Refresh Data icon with the “hockey puck” and red arrow does not notify you that updates are available. You must click the button in order to retrieve updated data. **Note** Clicking Refresh Data in the Domain Explorer window refreshes all data for the entire Cisco MGM client. Depending on the number of NEs in your network, you might experience a delay while the data refreshes. **Note** It takes longer to refresh data from the NE than from the server.
	Reset All Alarms/Events	Clears (resets) all alarms or events from the current view. Clears all alarms from the Alarm Browser window and fetches the alarms from now (current time on the server machine) onward.
	Reset to Default Size	Resets the current window to its default size.
	Save	Saves changes made in the current window.
	Show Alarm Note	Opens the Alarm Note dialog box for the selected alarm. Shows any comments that were entered for the selected alarm and adds additional comments. Table A-11 provides descriptions of the fields in the Alarm Note Dialog Box.
	Show Cleared Alarms	Shows all alarms that have been cleared.

Table A-2 Toolbar Tools Description (continued)

Tool	Item	Description
	Show Parent Network Map	See Parent.
	Unlock User	Allows you to unlock a user account.
	Zoom Area	Allows you to pan and zoom the view to a different region.
	Zoom In	Allows you to zoom in on the Network Map.
	Zoom Out	Allows you to zoom out on the Network Map.

A.3 Menu Options

The various Cisco MGM menu options are described below, in the order they appear on each menu.

This section includes the following information:

- A.3.1 File Menu
- A.3.2 Edit Menu
- A.3.3 Fault Menu
- A.3.4 Performance Menu
- A.3.5 Configuration Menu
- A.3.6 Administration Menu
- A.3.7 Window Menu
- A.3.8 Help Menu

A.3.1 File Menu

This section describes the tools within the File menu in each application:

- Domain Explorer—File Menu Tools Description
- Network Map—File Menu Tools Description
- Alarm Browser, Alarm Log, Domain NE Table, Equipment Inventory Table, and Control Panel—File Menu Tools Description

Table A-3 Domain Explorer—File Menu Tools Description

Item	Description
New Group	Opens the New Group dialog box. From here, you can add a new group, give the group a name, specify the group's geographic location, and provide a brief description of the group.
Add Network Element(s)	Opens the Add New Network Element wizard, which allows you to add a new NE or add several new NEs at once.
Dashboard	Opens the Cisco MGM Dashboard, which shows the number of NEs in the management domain, and the number of critical, major, minor, warning, or unacknowledged alarms. In addition, the dashboard contains an Alarm Browser tool, which allows you to launch the Alarm Browser window, and an Open Domain Explorer tool, which layers the Domain Explorer window as the top active window.
Network Map	Opens the Network Map window for the selected node.
Domain NE Table	Opens the Domain NE Table window for the selected node.
Notify Users	Opens the Notify Users dialog box.
Refresh Data	Refreshes all data being displayed by Cisco MGM. There are two icons, and both refresh data from either the server or the database. The Refresh Data icon with blue and red arrow (as seen in Circuit Table) flashes when updates are available. This icon has two modes: manual refresh and autorefresh. The Refresh Data icon with the “hockey puck” and red arrow does not notify you that updates are available. You must click the button in order to retrieve updated data. **Note** Clicking Refresh Data in the Domain Explorer window refreshes all data for the entire Cisco MGM client. Depending on the number of NEs in your network, you might experience a delay while the data refreshes. **Note** It takes longer to refresh data from the NE than from the server.
Debug Options	Opens the Debug Options dialog box. Use this dialog box to select parameters for the Debug Log, which contains data that is useful for debugging purposes.
Lock Cisco MGM Client	Prevents the Cisco MGM client from being used and opens the Cisco MGM Locked window.
Exit	Exits the program.

Table A-4 Network Map—File Menu Tools Description

Item	Description
Open	
Parent (also Show Parent Network Map)	If the Network Map is open to a specific NE, clicking Parent or Show Parent Network Map shifts the view back to the main Network Map view.
Save	Saves changes made in the current window.

Table A-4 Network Map—File Menu Tools Description (continued)

Item	Description
Save as Default	Saves your customizations (map background, node icons, and x and y coordinates) as the default map view.
Revert to Default	Reverts your map customizations.
Notify Users	Opens the Notify Users dialog box.
Refresh Data	Refreshes all data being displayed by Cisco MGM. There are two icons, and both refresh data from either the server or the database. The Refresh Data icon with blue and red arrow (as seen in Circuit Table) flashes when updates are available. This icon has two modes: manual refresh and autorefresh. The Refresh Data icon with the “hockey puck” and red arrow does not notify you that updates are available. You must click the button in order to retrieve updated data. **Note** Clicking Refresh Data in the Domain Explorer window refreshes all data for the entire Cisco MGM client. Depending on the number of NEs in your network, you might experience a delay while the data refreshes. **Note** It takes longer to refresh data from the NE than from the server.
Debug Options	Opens the Debug Options dialog box. Use this dialog box to select parameters for the Debug Log, which contains data that is useful for debugging purposes.
Close	Closes the current window.

Table A-5 Alarm Browser, Alarm Log, Domain NE Table, Equipment Inventory Table, and Control Panel—File Menu Tools Description

Item	Description
Page Back	Moves the table backward by one page if there is more than one page of data.
Page Forward	Moves the table forward by one page if there is more than one page of data.
Filter	Opens a filter dialog box, which allows you to filter for information found in the table or window. **Note** Use the percent sign (%) as a wildcard character for filtering on substrings.
Export	Opens the Export dialog box.Exports data, such as alarms, events, and error logs. Data is exported in comma-separated values (CSV) or tab separated values (TSV) formats.
HTML Report	Allows you to generate an HTML report based on the data in the table. You can generate a report for selected rows or for all rows. After you have made your selection, the browser window appears with the HTML report. Use your browser's Print option to print the HTML report.

Table A-5 Alarm Browser, Alarm Log, Domain NE Table, Equipment Inventory Table, and Control Panel—File Menu Tools Description (continued)

Item	Description
Refresh Data	Refreshes all data being displayed by Cisco MGM. There are two icons, and both refresh data from either the server or the database. The Refresh Data icon with blue and red arrow (as seen in Circuit Table) flashes when updates are available. This icon has two modes: manual refresh and autorefresh. The Refresh Data icon with the “hockey puck” and red arrow does not notify you that updates are available. You must click the button in order to retrieve updated data. **Note** Clicking Refresh Data in the Domain Explorer window refreshes all data for the entire Cisco MGM client. Depending on the number of NEs in your network, you might experience a delay while the data refreshes. **Note** It takes longer to refresh data from the NE than from the server.
Debug Options	Opens the Debug Options dialog box. Use this dialog box to select parameters for the Debug Log, which contains data that is useful for debugging purposes.
Close	Closes the current window.

A.3.2 Edit Menu

This section describes the tools within the Edit menu in each application:

- Domain Explorer Edit Menu Tools Descriptions
- Network Map Edit Menu Tools Descriptions
- Cisco MGM User Edit Menu Tools Descriptions
- Job Monitor Edit Menu Tools Descriptions

Table A-6 Domain Explorer Edit Menu Tools Descriptions

Item	Description
Cut	Copies the selected NE to the clipboard. The selected item now appears in italics. The NE is not removed from its current location until the Paste action is performed.
Copy	Copies the selected NE to the clipboard. The selected NE now appears in italics.
Paste	Pastes the NE on the clipboard into the selected group.

Table A-6 Domain Explorer Edit Menu Tools Descriptions (continued)

Item	Description
Delete	Deletes the selected instance of the NE or group. If this is the last instance of the NE, the NE is placed in the Deleted NEs group. Only out-of-service NEs can be placed in the Deleted NEs group. To delete the NE from the database, select the NE in the Deleted NEs group and choose **Edit > Delete**; then, click **OK**. This removes the NE from the client view and deletes all records associated with the NE from the database. If this is the last instance of the group, the group must be empty before you can delete it.
Delete All	Deletes all instances of the selected NE or group. The NE is placed in the Deleted Network Elements group. Only out-of-service NEs can be placed in the Deleted NEs group. The group must be empty before you can delete it.
Undelete	Undeletes the selected object. Restores all instances of an NE in the Deleted Network Elements group to their previous locations in the Domain Explorer Hierarchy pane. If the original parent group no longer exists, Cisco MGM does not recreate the group. Instead, Cisco MGM restores the NE under the management domain node.
Expand	Expands the management domain or group to display all groups or NEs in that management domain or group.
Collapse	Collapses the management domain or group to hide all groups or NEs in that management domain or group.
Find	Opens the Find dialog box, which allows you to search the tree by node name, IP address, or description.
Find Next	Searches for the next occurrence of the entry that was searched for using the Find command.
User Preferences	Opens the User Preferences dialog box.
Change Password	Opens the Change Password dialog box, which allows you to change your Cisco MGM user password.

Table A-7 Network Map Edit Menu Tools Descriptions

Item	Description
Enable Drag	Enables drag and drop functionality for all nodes within the Network Map window.
Enable Offview	Enables the display of off-view icons within the Network Map window.
Change Map Background	Opens the Select Map Background dialog box, which allows you to choose a different geographic background for the selected view.

Table A-7 Network Map Edit Menu Tools Descriptions (continued)

Item	Description
Change Node Icon	Opens the Select Node Icon File dialog box, which allows you to select a new icon for the selected node.
Zoom In	Allows you to zoom in on the Network Map.
Zoom Out	Allows you to zoom out on the Network Map.
Zoom Area	Allows you to pan and zoom the view to a different region.
User Preferences	Opens the User Preferences dialog box.
Change Password	Opens the Change Password dialog box, which allows you to change your Cisco MGM user password.
Circular Layout	Arranges the NE on the Network Map in a circular formation.
Spring Layout	Arranges the icons on the Network Map in a coiled spring formation.
Table Layout	Arranges the icons on the Network Map in rows and columns.
Declutter Layout	Rearranges the icons on the Network Map so that they do not overlap.

Table A-8 Cisco MGM User Edit Menu Tools Descriptions

Item	Description
Create	Opens the Create New Cisco MGM User wizard.
Modify	Opens the Modify NE User wizard.
Delete	Deletes the selected instance of the NE or group. If this is the last instance of the NE, the NE is placed in the Deleted NEs group. Only out-of-service NEs can be placed in the Deleted NEs group. To delete the NE from the database, select the NE in the Deleted NEs group and choose **Edit > Delete**; then, click **OK**. This removes the NE from the client view and deletes all records associated with the NE from the database. If this is the last instance of the group, the group must be empty before you can delete it.
Unlock	Allows you to unlock a user account.

Table A-9 Job Monitor Edit Menu Tools Descriptions

Item	Description
Cancel Task	Allows you to cancel a task.
Cancel Job	Allows you to cancel a scheduled job. Cancel is enabled only for jobs with a Queued status.
User Note	Allows you to add a note to the job.
NESoftware Table	

A.3.3 Fault Menu

Table A-10 describes the tools within the Fault menu.

Table A-10 Fault Menu Tools Description

Item	Description
Alarm Browser	Opens the Alarm Browser window.
Alarm Log	Opens the Alarm Log window.
Event Export Manager	Opens the Event Export Manager window.
MGX8880/8850 MG > Diagnostic Center	Launch Diagnostic Center.

Table A-11 Field Descriptions for the Alarm Note Dialog Box

Field	Description
Note	Provides space to type comments about the selected alarm. To add your comments to the previous comments, click the **Append** radio button. To overwrite the previous comments, click **Replace**. To delete the comments, click **Delete**. **Note** You can enable and disable the Replace and Delete functions in the **Control Panel > User Interface Properties sheet**.
History	Displays comments that were entered by previous users.

A.3.4 Performance Menu

Table A-12 describes the option within the Performance menu.

Table A-12 Performance Menu Tools Description

Item	Description
MGX8880/8850 MG > Statistics Report	Launch Statistics Report.

A.3.5 Configuration Menu

Table A-13 describes the tools within the Configuration menu.

Table A-13 Configuration Menu Tools Description

Item	Description
MGX8880/8850 MG > Equipment Inventory Table	Launch Equipment Inventory Table.

Table A-13 Configuration Menu Tools Description (continued)

Item	Description
MGX8880/8850 MG > Chassis View	Launch Chassis View
MGX8880/8850 MG > Configuration Center	Launch Configuration Center.

A.3.6 Administration Menu

This section describes the tools within the Administration menu in each application:

- Domain Explorer Administration Menu Tools Description
- Cisco MGM Users Administration Menu Tools Description
- Control Panel Administration Menu Tools Description

Table A-14 Domain Explorer Administration Menu Tools Description

Item	Description
Job Monitor	Opens the Job Monitor window.
Service Monitor	Opens the Service Monitor Table window.
Self Monitor	Opens the Self Monitor window, where you can view information about Cisco MGM threshold parameters.
Memory Backup	Opens the Memory Backup dialog box.
Memory Restore	Opens the Memory Restore dialog box.
Software Download	Opens the Software Download dialog box.
Cisco MGM Users	Opens the Cisco MGM Users window.
Control Panel	Opens the Control Panel window.
Audit Log	Opens the Audit Log window.
Error Log	Opens the Error Log window.
Supported NE Table	Opens the Supported NE Table window.
MGX8880/8850 MG > Audit Trail	Launch Audit Trail.

Table A-15 Cisco MGM Users Administration Menu Tools Description

Item	Description
User Profiles	
Logged in Cisco MGM Users	Opens the Logged In Cisco MGM Users Table, which lists the Cisco MGM users who are currently logged into the Cisco MGM application.

Table A-16 Control Panel Administration Menu Tools Description

Item	Description
Audit Log	Opens the Audit Log window.
Error Log	Opens the Error Log window.
Supported NE Table	Opens the Supported NE Table window.
GW/CORBA Client Configuration Table	Opens the Cisco MGM GateWay/CORBA Client Configuration Table window.

A.3.7 Window Menu

Table A-17 describes the tools within the Window menu.

Table A-17 Window Menu Tool Description

Item	Description
Arrange Horizontally	When multiple Cisco MGM windows are open, this option displays the windows side-by-side horizontally.
Arrange Vertically	When multiple Cisco MGM windows are open, this option displays the windows side-by-side vertically.
Cascade	When multiple Cisco MGM windows are open, this option positions the active window in the upper left-hand corner, and all other windows are layered on top of the active window in cascading order.
Close All	Closes all Cisco MGM windows except the Domain Explorer.
Minimize All	Minimizes all Cisco MGM windows.
Restore All	Restores all minimized Cisco MGM windows.
Reset to Default Size	Resets the current window to its default size.

A.3.8 Help Menu

Table A-18 describes the tools within the Help menu.

Table A-18 Help Menu Tools Description

Item	Description
Color Legend	Displays the Alarm Color Legend.
Contents and Index	Displays the contents and index for the online help.
Current Window	Displays online help for the current window.
About Cisco MGM	Opens the About Cisco MGM dialog box, which lists the Cisco MGM release you are running.

A.4 Hierarchy Pane Icons

The following tables describe the icons shown in the Hierarchy pane:

- A.4.1 Object Icons
- A.4.2 Communication State Icons
- A.4.3 Operational State Icons
- A.4.4 Severity Icons
- A.4.5 Hierarchy Pane Navigation Icons

A.4.1 Object Icons

Table A-19 describes the object icons in the Hierarchy pane.

Table A-19 Object Icons

Object	Icon
Card	
Folder	
Group	
Line	
Network	
Path	
Peripheral	
Port	
Route Node	
Routing Node	

Table A-19 Object Icons (continued)

Object	Icon
RPM Subinterface	
Sensor	
Unknown NE	
Virtual Port	

A.4.2 Communication State Icons

Table A-20 describes the communication state icons within the Domain Explorer Hierarchy pane.

Table A-20 Communication State Icons

State	Icon
Available	
Unavailable	
Not Applicable	

A.4.3 Operational State Icons

Table A-21 describes the operational state icons within the Domain Explorer Hierarchy pane.

Table A-21 Operational State Icons

State	Icon
In Service	
In Service - Initializing	

Table A-21 Operational State Icons (continued)

State	Icon
In Service - Synch Configuration	
In Service - Undiscovered	
Under Maintenance	
Out of Service	

A.4.4 Severity Icons

Table A-22 describes the severity icons in the Domain Explorer Hierarchy pane.

Table A-22 Severity Icons

Severity	Color	Icon
Critical	Red	
Major	Orange	
Minor	Yellow	
Warning	Light Blue	
Cleared	Green	
Unknown	Gray	

A.4.5 Hierarchy Pane Navigation Icons

Table A-23 lists the icons that are used to navigate through the hierarchy pane in the Configuration Center, Statistics Report and Diagnostic Center.

Table A-23 Hierarchy Pane Navigation Icons

Item	Icon
Find	
Find Next	
Find Previous	
Expand One Level	
Expand Two Levels	
Expand Three Levels	
Sort Ascending/Descending	

A.5 Inspector View Icons

In the Configuration Center and Statistics Report, the Inspector View provides a list of detailed information for the selected network element from the hierarchy view. Click the **Show static data** button to update the information in the Inspector View.

Table A-24 Inspector View Icons

Icon	Example
Show static date	
Refresh static data	

A.6 Network Map Icons

The Network Map allows you to visualize the structure of your network. Table A-25 gives examples of the icons that appear in the Network Map. When you open the Network Map from a selected NE in the Domain Explorer, the selected NEs is pre-selected on the map. The icon has white text displayed on a black background. This allows you to distinguish the previously selected NE from the other NEs in the same map.

This section includes the following information:

- A.6.1 Icon States
- A.6.2 Icon Colors
- A.6.3 Operational and Communication State Icons
- A.6.4 Network Map Edit Menu

Table A-25 Network Map Icons

Icon	Example
MGX8880/MGX8850	
Not Managed/Other Vendor **Note** The Not Managed/Other Vendor icon is customizable.	

A.6.1 Icon States

Table A-26 describes the icon states for the icons displayed on the Network Map. Icon states are displayed according to condition priority. If two or more of the following states occur simultaneously on an icon, only the state with the highest priority is displayed:

- Loss of communications
- Under maintenance
- Unacknowledged alarms

Table A-26 Icon States

State	Icon Color	Overlay	Example
Loss of communications	Icon color indicates whether the NE is reachable	Red and white border	
Under maintenance	Icon color indicates whether the NE is under maintenance	Yellow and black border	
Unacknowledged alarms	Icon color indicates whether an unacknowledged alarm is present on the NE	Cream border	
Initializing	Icon color indicates that the NE is initializing	Blue and white border	
Synch configuration	Icon color indicates that the NE is in the synchronization configuration state	Blue and black border	
Out of service	Gray	None	
Unknown NE model	Gray	None	
Off-view icon	Icon color indicates the last know alarm status of the NE that the off-view icon represents.	None	

A.6.2 Icon Colors

Table A-27 displays map icons with the following colors:

Table A-27 Icon Colors

Status	Colors	Example
Critical	Red	
Major	Orange	
Minor	Yellow	
Warning	Light blue	
Clear	Green	
Out of service	Gray	

A.6.3 Operational and Communication State Icons

Table A-28 describes the operational and communication state map representation icons in the Network Map pane.

Table A-28 Operational and Communication State Map Representation Icons

State	Icon	Icon Color	Border Color
Loss of Communication (Communication State is Unavailable)		Red	Red/White
In Service		Orange	None
In Service - Initializing		Gray	Blue/White
In Service - Synch Configuration		Red	Blue/Black
Under Maintenance		Red	Black/Yellow
Out of Service		Gray	None

A.6.4 Network Map Edit Menu

Use the Edit menu and toolbar buttons to customize your Network Map. Choose the **Enable Drag** toolbar button to enable drag and drop functionality and easily display network partitioning. Other Edit menu options allow you to enable the display of off-view icons, change geographic backgrounds for the selected view, select a layout format for the icons, adjust the zoom level, or choose icons to represent specific nodes.

Note Use the **File > Save as Default** menu option to save your customizations (map background, node icons, and x and y coordinates) as the default map view. The Save as Default option is disabled for the root or Cisco MGM domain node. By default, the customized map background and node icons are saved on your local workstation under <*client_install_directory*>/images/mapbkgnds/custom/default and <*client_install_directory*>/images/mapicons/custom/default.

Note Use the **File > Revert to Default** menu option to revert your map customizations.

You can choose whether multiple windows or a single window are used for navigation:

Step 1 In the Network Map window, choose **Edit > User Preferences**.

Step 2 In the **Map Preferences** tab, check the **Open Network Map in New Window** check box to open a new window for subsequent map views, or leave the check box unchecked to open subsequent map frames in the same window.

Step 3 Click **OK**.

If an NE has a link defined to an NE on a different map, the off-view NE is represented by an off-view icon. The off-view icon serves as a hyperlink to the map that contains the NE at the opposite end of the link. Off-view icons are used only for links that terminate on an NE; off-view icons are not used for groups. You can enable or disable the display of off-view icons in the Network Map, as follows:

Note Link colors and NE alarm colors are identical.

Step 1 Choose **Edit > User Preferences**.

Step 2 In the **Map Preferences** tab, check the **Show Off View Icons** check box to show off-view icons in the Network Map, or leave the check box unchecked to hide off-view icons.

Step 3 Click **OK**.

The names that display under graphics on the map are truncated if they are too long to fit. By default, the end characters are truncated. If you want beginning characters truncated:

Step 4 Choose **Administration > Control Panel** in the Domain Explorer window.

Step 5 Click the **UI** tool to open the **UI Properties** sheet.

Step 6 Click the **Truncate Network Map Node Name First Characters** radio button.

Step 7 Click **Save**.

Step 8 Click **Yes** to confirm the change.

Step 9 In the Network Map window, click the **Refresh Data** tool.

Error Messages

This appendix describes the error messages and recommends solutions. It contains the following sections:

- B.1 Cisco MGM Client Error and Warning Messages, page B-1
- B.2 Cisco MGM Server Error Messages, page B-61
  - B.2.1 Critical Server Error Messages, page B-61
  - B.2.2 Major Server Error Messages, page B-68
  - B.2.3 Minor Server Error Messages, page B-87
  - B.2.4 Debug Server Error Messages, page B-104
- B.3 Cisco MGM Server Audit Messages, page B-104

B.1 Cisco MGM Client Error and Warning Messages

Error and warning messages are categorized by message type and are listed in ascending numeric order within each category.

Note Because error and warning messages are grouped in number ranges, they are not listed in exact numeric order.

Error Message `EID-100: Fatal error: Cannot connect to EMS server. Check the configuration and retry.`

Recommended Action Check your configuration in the *install_directory*/config/ems-client.cfg file and log in again.

Error Message `EID-102: Fatal error: This service is currently disabled. If the problem persists, contact your service provider.`

Recommended Action Retry later. If the problem persists, contact your service provider.

Error Message `EID-103: Fatal error: Connection to the EMS server was lost. The application will be shut down.`

Recommended Action Restart the application after verifying that the Cisco MGM server is operational and available from the client LAN.

Error Message `EID-104: Cisco MGM internal error: Invalid help URL.`

Recommended Action Contact your service provider or Cisco technical support.

Error Message `EID-105: This user is currently logged in. Second connection to the EMS server is not allowed.`

Recommended Action If you know where you are logged in currently, close that session. If you do not know where you are logged in, ask the administrator to end the session. After the session ends, start a new session.

Error Message `EID-106: Fatal error: Cannot initialize database connection. Verify that the EMS database is operational.`

Recommended Action Ask the administrator to check the database configuration. Contact Cisco technical support if the you cannot find problems with the database.

Error Message `EID-107: Cannot launch a JVM for help.`

Recommended Action Xterm is missing from the Sun Solaris path. Edit the ems-client.cfg file and provide the correct xterm path.

Alternately, there might not be enough memory to launch a separate help process. Shut down some applications to free memory.

Error Message `EID-108: The administrator has logged out your session. The MGM client will be closed.`

Recommended Action Try relogging into Cisco MGM client.

Error Message `EID-109: Could not log back into MGM server. Cannot start server.`

Recommended Action Run the **showmgm** command to see what Cisco MGM server processes are running. Restart the Cisco MGM server using the **mgms-start** command.

Error Message `EID-110: Could not log back into MGM standby server(s).`

Recommended Action Cisco MGM client cannot connect to the servers listed in Control Panel > Recovery Properties > Server Lists. Ping the IP address of the server that you are trying to connect to.

Error Message `EID-111: Your password has expired. You need to set a new password. Do you want to continue?`

Recommended Action Enter a new password.

Error Message `EID-112: You are entering a protected Cisco domain. Do you want to continue?`

Recommended Action Click **OK** to continue.

Error Message `EID-113: Invalid password: The password cannot contain the same characters as the user ID, even in a different order.`

Recommended Action Choose a different password, one that does not contain the same characters as your username.

Error Message `EID-114: Invalid password: The new password must differ from the old password by at least three characters.`

Recommended Action Choose a different password, one that differs from your old password by at least three characters.

Error Message `EID-115: Cannot save Auto Refresh state in User Preferences database table.`

Recommended Action Check your database. Cannot update Auto Refresh Mode in the USER_PREFERENCES_TABLE.

Error Message `EID-116: Cannot launch a browser. Verify that a browser is installed on your system and that the browser path in ems-client.cfg is set correctly.`

Recommended Action Use the following procedure to correct the error:

Step 1 Verify that the browser path is correct in the ems-client.cfg file.

Step 2 Check the browser version. Cisco MGM 5.0 supports Internet Explorer 5.5 and later, and Netscape 4.79 and later.

Step 3 Ensure that the browser is Javascript-enabled in Windows.

Step 4 If Steps 1 to 3 do not correct the error, install a new browser.

Error Message `EID-117: Cannot launch a browser. MGM uses the default browser to display the online help. If you want to use a specific browser to launch MGM online help, make the default browser for your workstation "javascript:scrollTo(0,3400) Scroll down to Save Issue.`

Recommended Action Check your $PATH variable and make sure that "netscape" is included in the PATH. Also run the **netscape** command from your command prompt and make sure that the browser comes up.

Error Message `EID-118: Your password has been set by the administrator. You need to set a new password. Do you want to continue?`

Recommended Action Continue setting a new password.

Error Message `EID-120: This session has logged out. MGM client will be closed.`

Recommended Action The logout timer has logged you out of this session. Log back into Cisco MGM client and modify client inactivity timer settings in Control Panel > Security Properties.

Error Message `EID-121: Client application cannot be restarted because the required port is not available.`

Recommended Action Restart Cisco MGM client.

Error Message `EID-126: The table view has changed. You must refresh the table before performing this operation.`

Recommended Action Click the **Refresh Data** tool.

Error Message `EID-127: An error occurred while scheduling the SNTP configuration.`

Recommended Action Error occurred while scheduling Simple Network Time Protocol (SNTP). Try performing the task again.

Error Message `EID-130: Cannot authenticate user. Try again.`

Recommended Action Enter your username and password and retry.

Error Message `EID-131: Cannot connect to the specified EMS server. Check IP connectivity and try again.`

Recommended Action Ping the server workstation to see if you have IP connectivity. If there is no connectivity, contact the administrator to verify that connectivity is established.

Error Message `EID-132: User disabled due to a security violation. Contact administrator to enable user account.`

Recommended Action Contact the administrator to re-enable the user account.

Error Message `EID-133: Specify a username.`

Recommended Action Enter the username.

Error Message `EID-134: Enter or select an IP address.`

Recommended Action Enter the IP address.

Error Message `EID-136: No Undeleted NEs in the Selection Context.`

Recommended Action The NEs are no longer available. Relaunch the window.

Error Message `EID-137: No Finish Action defined for the Selected Model.`

Recommended Action No action was defined to complete operation on the NE. Select a different NE.

Error Message `EID-140: Select at least one NE or select Export EMS Alarms.`

Recommended Action Select at least one NE or select **Export EMS Alarms**.

Error Message `EID-141: Specify the alarm severity.`

Recommended Action Select at least one alarm severity from the list provided.

Error Message `EID-142: Specify the export destination file.`

Recommended Action Specify the export destination file.

Error Message `EID-143: Cannot write to specified export file.`

Recommended Action Verify that the user has the required permission in the directory where the export file is being created. Verify that there is enough disk space available; then, retry.

Error Message `EID-144: Cannot create directory: directory_name.`

Recommended Action Verify that the user has the required permission in the directory where the export file is being created. Verify that there is enough disk space available; then, retry. Verify that there is no existing directory with the name directory_name.

Error Message `EID-145: Illegal record count. Enter a positive integer.`

Recommended Action Enter a positive integer.

Error Message `EID-146: Event Export Manager - Cannot create or append to` *`filename`*`. Check access rights and disk space.`

Recommended Action Check access rights and disk space.

Error Message `EID-147: Event Export Manager - Cannot write to` *`filename`*`. Check access rights and disk space.`

Recommended Action Check access rights and disk space.

Error Message `EID-148: Enter the message to be sent.`

Recommended Action No message is specified. Enter the message you want to send.

Error Message `EID-149: Message is too long. Only the first 512 bytes will be sent.`

Recommended Action The maximum message size allowed is 512 bytes. If you entered more than 512 bytes, only the first 512 bytes will be sent.

Error Message `EID-150: Illegal threshold value. Enter a number between 0 and 100.`

Recommended Action Enter a number between 0 and 100.

Error Message `EID-152: No MGM server to NE connection username. Username is a mandatory field. Specify a username.`

Recommended Action Enter a username.

Error Message `EID-154: The ML-series card to NE connection username is a mandatory field. Specify a username.`

Recommended Action Enter an ML-series card username.

Error Message `EID-155: The MGM server to NE connection username is a mandatory field. Specify a username.`

Recommended Action Enter a username.

Error Message `EID-159: Selected NEs for software download are of different model types.`

Recommended Action Reselect the NEs. All NEs selected for software download must be the same model type.

Error Message `EID-160: Year entered is before the current year. Enter a year greater than or equal to the current year.`

Recommended Action Enter a year that is equal to or greater than the current year.

Error Message `EID-161: Month entered is before the current month. Enter a month greater than or equal to the current month.`

Recommended Action Enter a month that is equal to or greater than the current month.

Error Message `EID-162: Date entered is before the current date. Enter a date greater than or equal to the current date.`

Recommended Action Enter a day of the month that is equal to or greater than the current day of the month. The day should be a valid day for the month and year selected.

Error Message `EID-163: Hour entered is before the current hour. Enter an hour greater than or equal to the current hour.`

Recommended Action Enter an hour that is greater than or equal to the current hour.

Error Message `EID-164: Minute entered is before the current minute. Enter a minute greater than or equal to the current minute.`

Recommended Action Enter a minute that is greater than or equal to the current minute.

Error Message `EID-165: Source filename is empty. Enter a valid filename.`

Recommended Action Enter a source filename, which is required for the software download or memory restore operation.

Error Message `EID-166: Source filename does not exist. Enter a valid filename.`

Recommended Action The source filename specified for the software download or memory restore operation does not exist. Specify a valid source filename.

Error Message `EID-167: Selected NE list is empty. Select NEs from the Available NEs list.`

Recommended Action Select at least one NE for the memory backup or software download operation.

Note You can run the memory restore operation for only one NE at a time.

Error Message `EID-168: An error occurred while scheduling the software download operation.`

Recommended Action The software download operation could not be scheduled. Restart the Cisco MGM client and retry the software download operation.

Error Message `EID-169: An error occurred while scheduling the memory restore operation.`

Recommended Action The memory restore operation could not be scheduled. Restart the Cisco MGM client and retry the memory restore operation.

Error Message `EID-170: An error occurred while scheduling the memory backup operation.`

Recommended Action The memory backup operation could not be scheduled. Restart the Cisco MGM client and retry the memory backup operation.

Error Message `EID-173: An error occurred while sending the message.`

Recommended Action The message could not be delivered. Restart the Cisco MGM client, retype the message, and resend.

Error Message `EID-174: Cannot retrieve the list of existing configuration files for the NE.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-176: An error occurred while reading the global MGM configuration.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-177: An error occurred while modifying the global MGM configuration. Changes might not take effect.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-178: An error occurred while modifying the global MGM configuration. Changes might not be communicated to other MGM clients.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-180: An error occurred while starting this service. Verify that this service is installed on the MGM server and retry.`

Recommended Action Use the following procedure to verify that the Cisco MGM processes are running:

Step 1 Log into the Cisco MGM server as the root user and enter the following command:

```
showmgm
```

Step 2 Contact Cisco technical support with the results of the **showmgm** command.

Error Message `EID-181: An internal state error occurred. Do you want to continue using a default standard configuration?`

Recommended Action Click **Yes** or **No**; then, continue accordingly. Alternately, reopen the Control Panel window.

Error Message `EID-182: An internal state denied the request to read the configuration. Do you want to continue using a default standard configuration?`

Recommended Action Click **Yes** or **No**; then, continue accordingly. Alternately, reopen the Control Panel window.

Error Message `EID-183: An I/O error occurred. Do you want to continue using a default standard configuration?`

Recommended Action Click **Yes** or **No**; then, continue accordingly. Alternately, reopen the Control Panel window.

Error Message `EID-184: An internal protocol error occurred. Do you want to continue using a default standard configuration?`

Recommended Action Click **Yes** or **No**; then, continue accordingly. Alternately, reopen the Control Panel window.

Error Message `EID-185: An internal error prevented the current configuration file from being opened.`

Recommended Action An incorrect server configuration appears on the Control Panel window. Reopen it and verify that the server parameters are correct.

Error Message `EID-186: The request to open the current configuration file was denied.`

Recommended Action An incorrect server configuration appears on the Control Panel window. Reopen it and verify that the server parameters are correct.

Error Message `EID-187: There is a problem opening the current configuration file.`

Recommended Action An incorrect server configuration appears on the Control Panel window. Reopen it and verify that the server parameters are correct.

Error Message `EID-188: An exception occurred while opening the current configuration file.`

Recommended Action An incorrect server configuration appears on the Control Panel window. Reopen it and verify that the server parameters are correct.

Error Message `EID-189: There is an input character problem in the current configuration file.`

Recommended Action An incorrect server configuration appears on the Control Panel window. Reopen it and verify that the server parameters are correct.

Error Message `EID-190: Error detected in the server configuration file at line` *`line_number`*.

Recommended Action The server configuration file contains an invalid entry (or is missing a mandatory entry) at the line specified. If the line number specified is one more than the last line in the file, invalid data exists on the last line, or some mandatory field values are missing after the last line.

Error Message `EID-191: Error occurred while writing the changes to the server configuration file. The previous changes made to the server configuration have been lost.`

Recommended Action Refresh the Control Panel window. Redo the changes and click **Save**.

Error Message `EID-192: Server configuration has been modified by another user since it was last read. You must refresh this view before any changes can be made to the server configuration file.`

Recommended Action To proceed with the save, click the **Refresh Data** tool, change the selected Control Panel property sheet, and click **Save**.

Error Message `EID-193: This IP address was already added as an {0}.`

Recommended Action Enter a different IP address.

Error Message `EID-194: A maximum of n can be configured. You must remove an existing host if you want to add another host.`

Recommended Action Remove an existing Simple Network Management Protocol (SNMP) host; then, add a new host.

Error Message `EID-196: An error occurred while sending the truncate queue event to the server.`

Recommended Action Error while sending event to the server. Restart client.

Error Message `EID-198: An error occurred while scheduling the Alarm Profile Management operation.`

Recommended Action Reschedule the job.

Error Message `EID-199: An error occurred while scheduling the Disclaimer Message Management operation.`

Recommended Action Reschedule the job.

Error Message `EID-200: An error occurred while scheduling the NE Defaults Management operation.`

Recommended Action Reschedule the job.

Error Message `EID-201: An error has occurred while scheduling the configure node operation.`

Recommended Action Make sure that the node is reachable and in service. Try again.

Error Message `EID-206: Duplicate server address. Enter a unique address.`

Recommended Action Enter a unique server address.

Error Message `EID-207: A maximum of n servers can be configured. You must remove an existing server to add another server.`

Recommended Action Remove an existing server; then, configure another server.

Error Message `EID-208: Could not cancel selected task(s). Action failed.`

Recommended Action The selected task or job is already running or has already been cancelled. Click the **Refresh Data** tool to see the current status.

Error Message `EID-209: Could not cancel selected job(s). Action failed.`

Recommended Action The selected task or job is already running or has already been cancelled. Click the **Refresh Data** tool to see the current status.

Error Message `EID-210: Could not activate selected task(s). Action failed.`

Recommended Action Activate (Commit) fails when the active software version is newer than the standby software version. Only the reactivate (Revert) operation is allowed in this case.

Reactivate (Revert) fails when the active software version is older than the standby software version. Only the activate (Commit) operation is allowed in this case.

Activate or reactivate might fail because a similar administrative operation (such as backup, restore, download, or commit/revert) occurs on the NE. Wait several minutes and try again.

Error Message `EID-211: Could not reactivate job(s). Action failed.`

Recommended Action Activate (Commit) fails when the active software version is newer than the standby software version. Only the reactivate (Revert) operation is allowed in this case.

Reactivate (Revert) fails when the active software version is older than the standby software version. Only the activate (Commit) operation is allowed in this case.

Activate or reactivate might fail because a similar administrative operation (such as backup, restore, download, or commit/revert) occurs on the NE. Wait several minutes and try again.

Error Message `EID-212: Software image download failed for` *`NE_ID`*`.`

Recommended Action The software image file might be empty or corrupt. Or, the problem might be the communication link between Cisco MGM and the NE; the NE might not perform the correct handshake response with the Cisco MGM. Retry the software download.

Error Message `EID-215: There are no reachable or known model NEs.`

Recommended Action The NE you chose is unreachable or the NE model type does not support the operation. Choose a different NE.

Error Message `EID-216: No partitions for` *`NEs`*`.`

Recommended Action Initial discovery might still be in progress. Try again after some time.

Error Message `EID-217: Selected NEs do not have a partition selected to download the image file.`

Recommended Action The selected NE does not have a partition selected for downloading the image. Select a partition to which the image will be downloaded.

Error Message `EID-218: Some NEs have no associated partitions to download the image file. Proceed anyway?`

Recommended Action One or more of the selected NEs have no partition selected for downloading the image. Select appropriate Flash partitions for all NEs. If you proceed anyway, those NEs will not be scheduled for image download.

Error Message `EID-219: Some selected NE Flash partitions do not have enough space for the image.`

Recommended Action Clean up the space on the Flash partition before job execution time or the job will fail.

Error Message `EID-220: This operation will only append the new commands to the already running configuration. It will not replace the existing running configuration. Proceed anyway?`

Recommended Action Restoring the configuration file as running configuration will only append to the existing running configuration and will not delete the commands that are now present in the new configuration file. This is not a replacement of the running configuration.

Error Message `EID-221: Add at least one NE and a Flash bank in Selected Downloads to download the image file.`

Recommended Action Add at least one NE and a Flash bank to the Selected Downloads list.

Error Message `EID-225: OSS Client Name is a required field. Specify a unique name for this OSS client and retry.`

Recommended Action Enter a unique OSS client name and retry.

Error Message `EID-226: An EFD has not been associated with this OSS client. Choose an existing EFD or create a new one for this OSS client and retry.`

Recommended Action Choose an EFD or create a new EFD; then, retry.

Error Message `EID-227: IP Address is a required field. Specify a unique IP address for this OSS client and retry.`

Recommended Action Enter a unique IP address and retry.

Error Message `EID-228: An OSS client with the same name already exists. Specify a unique OSS client name and retry.`

Recommended Action Enter a unique OSS client name and retry.

Error Message `EID-229: An EFD with the same name already exists. Specify a unique EFD name and retry.`

Recommended Action Enter a unique EFD name and retry.

Error Message `EID-230: An OSS IP address with the same name already exists. Specify a unique IP address and retry.`

Recommended Action Enter a unique IP address and retry.

Error Message `EID-231: An error occurred while reading the database. Restart the MGM client and retry.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-232: An error occurred while creating a new EFD. Try to add the EFD again.`

Recommended Action A database error occurred during this operation. Add the EFD again.

Error Message `EID-233: Unable to delete the user from the database. Check whether the user is already logged in.`

Recommended Action Check if the user is logged in.

Error Message `EID-234: EFD Name is a required field. Specify a unique name for this EFD and retry.`

Recommended Action Enter a unique EFD name and retry.

Error Message `EID-235: The password confirmation does not match the actual password. Try again.`

Recommended Action Reenter the password.

Error Message `EID-236: An error occurred while saving the OSS client properties to the database. Make the changes again and retry.`

Recommended Action Redo the EFD changes; then, retry.

Error Message `EID-237: The Password field is mandatory. Enter the password.`

Recommended Action Enter a password that is at least four characters in length.

Error Message `EID-238: At least one network element should be allowed.`

Recommended Action Add at least one NE to the EFD.

Error Message `EID-239: At least one access element should be allowed.`

Recommended Action Add at least one access element to the EFD.

Error Message `EID-241: An error occurred while logging out a MGM user.`

Recommended Action Retry.

Error Message `EID-242: The OSS client name cannot be <NEW>. Enter another name.`

Recommended Action Enter an OSS client profile name other than "<NEW>."

Error Message `EID-243: An error occurred while stopping this service.`

Recommended Action Use the following procedure to verify that the Cisco MGM processes are running:

Step 1 Log into the Cisco MGM server as the root user and enter the following command:

```
showmgm
```

Step 2 Contact Cisco technical support with the results of the **showmgm** command.

Error Message `EID-244: Unable to retrieve model or service type for this service.`

Recommended Action Try again.

Error Message `EID-245: Modified OSS client was not found in the database.`

Recommended Action Database user data missing. Recreate the OSS user.

Error Message `EID-246: An error occurred while sending events to other clients.`

Recommended Action JMOCO notification error. Restart the Cisco MGM client.

Error Message `EID-247: Cannot delete a new client.`

Recommended Action Error deleting selected OSS client. Select another OSS client with an OSS name length greater than 0 characters.

Error Message `EID-248: TID/SID for MGM is mandatory. Enter a value.`

Recommended Action Enter a target identifier (TID) or source identifier (SID) value.

Error Message `EID-249: Threshold values must follow the order Critical > Major > Minor. Enter valid values.`

Recommended Action Enter threshold values where the critical value is greater than the major value, which is greater than the minor value.

Error Message `EID-250: In the Time Period selection, the start time is greater than the end time.`

Recommended Action Enter a start time that is before the end time.

Error Message `EID-253: The selection list contains only the deleted NE.`

Recommended Action Relaunch the window.

Error Message `EID-254: The deleted NE was removed from the selection list.`

Recommended Action One or more NEs has been deleted. Relaunch the window.

Error Message `EID-255: Tag can have only alphanumeric, underscore (_), and period (.) characters.`

Recommended Action Add a tag that contains only alphanumeric characters, an underscore, or a period.

Error Message `EID-256: This username is being used by another MGM user. Choose a different username.`

Recommended Action Choose a different username.

Error Message `EID-257: The new password does not match the confirmation password. Retype the password.`

Recommended Action Reenter the password.

Error Message `EID-258: An error occurred while scheduling the job related to NE user management.`

Recommended Action Error occurred while scheduling the job. Try doing the task again.

Error Message EID-259: Select a user to modify.

Recommended Action Select a user.

Error Message EID-260: Select an NE for the user.

Recommended Action Select an NE.

Error Message EID-261: This user is already defined on some or all of your selected NEs.

Recommended Action Select a different user.

Error Message EID-262: Select at least one user.

Recommended Action Select at least one user.

Error Message EID-263: Change the user attributes.

Recommended Action Change the user attributes.

Error Message EID-264: Selected user has been deleted from the NE.

Recommended Action Select a different user.

Error Message EID-265: Fatal error occurred while notifying the *product_name* server of this change. Restart the server and all the clients.

Recommended Action Restart the Cisco MGM server and clients.

Error Message EID-266: Old MGM User Password field cannot be empty. Enter the old password and retry.

Recommended Action Enter the old user password and retry.

Error Message EID-267: The MGM password you entered does not match the MGM user password. Try again.

Recommended Action Reenter the user password.

Error Message EID-268: The new password does not match confirmation password. Try again.

Recommended Action Reenter the confirmation password.

Error Message `EID-269: Database error: Cannot change the user password.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-273: The change password feature has been disabled by the administrator for this user.`

Recommended Action Contact the Cisco MGM administrator to enable the change password feature for this user.

Error Message `EID-274: All the fields are blank. Enter valid entries.`

Recommended Action Enter valid entries.

Error Message `EID-284: The lockout period must be between 1 and 120.`

Recommended Action Enter a lockout period between 1 and 120.

Error Message `EID-285: The logout period must be between 1 and 1440.`

Recommended Action Enter a logout period between 1 and 1440.

Error Message `EID-286: Enter a valid profile name. You did not enter a profile name, or you chose 'Default' or 'Inherited' as the profile name.`

Recommended Action Enter a valid profile name.

Error Message `EID-286: Enter a rate value when IP priority queuing is enabled.`

Recommended Action Enter a rate value.

Error Message `EID-288: Accept operation failed or is not allowed.`

Recommended Action Entry does not exist.

Error Message `EID-290: The logout period must be greater than the lockout period. Changes will not take effect.`

Recommended Action Enter a logout period that is greater than the lockout period.

Error Message `EID-297:EID-300: Cannot open file` *`filename`*`. Privileges to write data are not available.`

Recommended Action You have read access only; this operation requires read/write access. Log out and log in again with a username and password that have read/write access.

Error Message EID-301: Export data error: Table not instantiated.

Recommended Action You cannot export data before the table is fully open. Wait until the table opens fully; then, click the **Export** tool.

Error Message EID-302: Export data: Error in opening file *filename* to export data.

Recommended Action The file could not be opened for writing the data. This could be due to insufficient permission in the selected directory. Choose a directory with write permission or change the permission to allow writing data in the selected directory.

Error Message EID-303: Resync Time (1530x only): Value should be in the range 30 to 2147483647.

Recommended Action Enter a value from 30 to 2147483647.

Error Message EID-304: Enter a filename for export.

Recommended Action Enter a filename for the exported file.

Error Message EID-305: File *filename* already exists. Do you want to overwrite it?

Recommended Action The file that you have provided already exists. Verify that you want to overwrite the file before clicking **OK**.

Error Message EID-306: Cannot write to *filename*. Check if you have sufficient disk space and permissions to write. Check if another application is using the file.

Recommended Action Change the permission on the specified file or choose a different filename. If there is insufficient disk space, delete some files to make space on the disk.

Error Message EID-307: *Filename*: Path does not exist or there is no write permission. Verify that the path to the file exists and you have write permission.

Recommended Action A directory that is part of the path that you specified to the file does not exist or has no permissions to read or write. Create the directory structure to store the file with read/write permissions; then, specify the path. Or, specify a valid path.

Error Message 308: *Directory_name* is a directory. Enter a filename.

Recommended Action Enter a filename instead of a directory name.

Error Message EID-309: Enter a character for separating fields during export.

Recommended Action You clicked the **Other** radio button but did not specify a separation character. Specify the character that you want to use as the separation character.

Error Message `EID-310: Graph is not available at this time.`

Recommended Action The graph could not be started because the NE could not be contacted. Verify that the NE is available and retry.

Error Message `EID-311: BER statistics are not available at this time.`

Recommended Action The bit error rate (BER) window could not be opened because the NE could not be contacted. Verify that the NE is available and retry.

Error Message `EID-312: The table will be sorted on the Time Stamp column to show new rows. Press OK to sort. You can cancel and sort the table by time stamp later to see the new rows.`

Recommended Action If you click **Cancel**, the rows are not sorted in chronological order. If you click **OK**, the rows are sorted in chronological order and the latest rows appear on top.

Error Message `EID-313: Cannot get system information from the NE. Check IP connectivity to the NE and restart the Node View.`

Recommended Action The SNMP query for system contact and location is not reaching the NE. After IP connectivity to the NE is restored, reopen the Node View window. The correct system contact and location information will appear.

Error Message `EID-314: Cannot retrieve NE data from the server.`

Recommended Action Restart the Cisco MGM client.

Error Message `EID-315: Error retrieving data from the database.`

Recommended Action Restart the Cisco MGM client and retry. Also, check the available memory on the server workstation.

Error Message `EID-316: Error while setting filter criteria in the database.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-317: Error while adding filter criteria in the database.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-318: Error while retrieving the total number of rows from the database.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-319: Error while sorting data in the database.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-320: Error while attempting read/write to the database.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-321: Error while sending request for alarm changed.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-322: Error while initializing table.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-323: You cannot delete an EFD profile that is used by an OSS client.`

Recommended Action Verify that the EFD profile you want to delete is not being used by an OSS client.

Error Message `EID-324: Cannot add an EFD profile.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-325: Cannot modify an EFD profile wizard.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-326: Error occurred while deleting the selected EFD profile.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-327: Error in event notification while deleting the selected EFD profile.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-330: Cannot launch table.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-331: Error occurred. Table will be closed.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-332: Exception while creating metadata for object.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-333: Database timeout occurred. Reduce the scope of the query or increase the timeout.`

Recommended Action Your database query is too broad. Reduce the scope of the query or increase the timeout by editing the DB_Query_Timeout_Seconds parameter in the config/ems-client.cfg file. The default timeout is 60 seconds.

Error Message `EID-340: The end ID must be greater than the start ID. Enter an end ID value that is greater than the start ID value.`

Recommended Action Enter an end ID value that is greater than the start ID value; then, click **OK** to filter the data.

Error Message `EID-341: The start/end IDs must be valid values. Enter valid values.`

Recommended Action Enter valid values for starting and ending IDs.

Error Message `EID-343: This network partition is not associated with a network element.`

Recommended Action Restart the Cisco MGM client and retry.

Error Message `EID-344: Cannot delete the last network partition.`

Recommended Action At least one network partition must be present. Do not delete this last network partition.

Error Message `EID-345: The exported data contains the separator character. Select another separator or check the check box to enclose text in double quotes if it includes the separator.`

Recommended Action Choose another separator or check the **Enclose text in double quotes** check box.

Error Message `EID-350: Database error: Cannot unlock the user.`

Recommended Action Retry the unlock operation.

Error Message EID-353: This operation will result in deleting the selected user(s) from the database. Press 'OK' to continue and 'Cancel' to abort the operation.

Recommended Action Click **OK** to delete the selected user(s), or click **Cancel**.

Error Message EID-354: This operation will result in deleting the selected user profile(s) from the database. Press 'OK' to continue and 'Cancel' to abort operation.

Recommended Action Click **OK** to delete the selected user profile(s), or click **Cancel**.

Error Message EID-400: This number is invalid. Enter a valid number to continue.

Recommended Action Enter a valid number.

Error Message EID-402: System name for this network element is inconsistent.

Recommended Action No action is required.

Error Message EID-403: Error occurred while reading the STS-1 configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-404: Error occurred while reading the VT configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-405: Error occurred while reading the serial interface configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-406: Error occurred while reading the multilink configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-407: Error occurred while reading the Ethernet port configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-408: Error occurred while reading the DS1 port configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-409: Error occurred while reading the OC-3 configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-410: Error occurred while reading the cross-connect configuration from the database. The data shown may be inconsistent with the network element's actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-411: Error occurred while specifying filter parameters for DS1 ports on the Cross-Connect Table.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-412: Error occurred while specifying filter parameters for Ethernet ports on the Cross-Connect Table.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-414: Error occurred while connecting to the remote console.

Recommended Action The NE is not available. Verify that the client can reach the NE and retry.

Error Message EID-420: Error occurred while reading the STM-1 configuration from the database. The data shown may be inconsistent with the network element’s actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message EID-421: Error occurred while reading the VC4 configuration from the database. The data shown may be inconsistent with the network element’s actual configuration.

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message `EID-422: Error occurred while reading the VC3 configuration from the database. The data shown may be inconsistent with the network element's actual configuration.`

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message `EID-423: Error occurred while reading the VC2 configuration from the database. The data shown may be inconsistent with the network element's actual configuration.`

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message `EID-424: Error occurred while reading the VC12 configuration from the database. The data shown may be inconsistent with the network element's actual configuration.`

Recommended Action Wait for a few minutes; then, click the **Refresh Data** tool to refresh the view.

Error Message `EID-429: DCC/GCC was created successfully but the set of AdminState failed.`

Recommended Action The port could not be set. Go to the property sheet of the related card and try to set the Admin State in the Line Config tab.

Error Message `EID-448: Deletion of Default and Inherited Alarm Profile is not allowed.`

Recommended Action Default and Inherited Alarm Profiles cannot be deleted.

Error Message `EID-449: Default and Inherited Alarm Profiles cannot be changed.`

Recommended Action Default and Inherited Alarm Profiles cannot be changed or deleted.

Error Message `EID-450: Alarm Profile by this name already exists. Please use another name.`

Recommended Action The selected name is already in use. Choose a different name.

Error Message `EID-451: Enter a valid SNTP server IP address.`

Recommended Action Enter a valid SNTP server IP address.

Error Message `EID-452: Enter a valid DHCP server IP address.`

Recommended Action Enter a valid Dynamic Host Configuration Protocol (DHCP) server IP address.

Error Message `EID-453: Protection group must have working card(s).`

Recommended Action Select a protection group that contains at least one working card.

Error Message `EID-454: Enter valid values for the protection group name, type, protect module, and working entities.`

Recommended Action Enter valid values.

Error Message `EID-455: Enter a valid value for Protection Group Name.`

Recommended Action Enter a valid protection group name.

Error Message `EID-456: Enter a valid value for Protect Module.`

Recommended Action Enter a valid protect module value.

Error Message `EID-457: Enter a valid value for Working Entities.`

Recommended Action Enter a valid working entities value.

Error Message `EID-458: Enter a valid value for Protection Type.`

Recommended Action Enter a valid protection type value.

Error Message `EID-459: Protection group name is too long. Maximum length is 32 characters.`

Recommended Action Enter a protection group name that does not exceed 32 characters.

Error Message `EID-460: Enter a valid SNMP trap destination IP address.`

Recommended Action Enter a valid SNMP trap destination IP address.

Error Message `EID-461: Enter a valid SNMP community name.`

Recommended Action Enter a valid SNMP community name.

Error Message `EID-462: 0.0.0.0 is not a valid DHCP server IP address. Enter a valid IP address.`

Recommended Action Enter a valid IP address.

Error Message `EID-463: 0.0.0.0 is not a valid SNTP server IP address. Enter a valid IP address.`

Recommended Action Enter a valid IP address.

Error Message `EID-464: Cannot create Ethernet thresholds on the following ports: port_number(s).`

Recommended Action Try creating the thresholds again.

Error Message `EID-465: The change was not saved successfully. Data will be reset to the previous value.`

Recommended Action Some attributes were not saved successfully. Check documentation to see any conditions that must be set up before setting the attributes.

Error Message `EID-469: Error occurred while creating the service provisioner.`

Recommended Action The server service is not ready. Wait several minutes and try again.

Error Message `EID-500: Searched item not found.`

Recommended Action No item in the Domain Explorer Hierarchy pane matches the search criteria you specified. Redefine the search criteria and run a new search.

Error Message `EID-501: Cannot launch a remote console to the selected NE.`

Recommended Action Xterm is missing from the Sun Solaris path. Edit the ems-client.cfg file and provide the correct xterm path.

Or, there is not enough memory to launch a separate Telnet process. Shut down some applications to free up memory.

Error Message `EID-502: Group Name is a mandatory field. Enter a unique group name and retry.`

Recommended Action Enter a unique name for the new group.

Error Message `EID-503: A group with the same name already exists. Specify a unique group name and retry.`

Recommended Action Enter a unique name for the new group.

Error Message `EID-504: A group name cannot be the same as a domain name. A domain with the same name already exists. Specify a unique group name and retry.`

Recommended Action Enter a unique name for the new group.

Error Message `EID-505: Database error: Error occurred while adding the new group to the database.`

Recommended Action A database error occurred while adding the new group. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry adding a new group.

Error Message `EID-506: Group name is too long. Restrict the name to 32 characters.`

Recommended Action Enter a unique group name that does not exceed 32 characters.

Error Message `EID-507: Group description is too long. Restrict the description to 256 characters.`

Recommended Action Enter a group description that does not exceed 256 characters.

Error Message `EID-511: NE ID is a mandatory field. Enter a unique NE ID and retry.`

Recommended Action Enter a unique ID for the NE.

Error Message `EID-512: An NE or GNE with the same ID already exists in the database. Enter a unique NE ID and retry.`

Recommended Action Enter a unique ID for the NE.

Error Message `EID-513: An NE with the same IP address already exists in the database. Enter a unique IP address and retry.`

Recommended Action Enter a unique ID for the NE that does not exceed 128 alphanumeric characters.

Error Message `EID-514: IP Address is a mandatory field. Enter a unique IP address and retry.`

Recommended Action Enter a unique IP address for the NE.

Error Message `EID-515: An NE or GNE with the same IP address already exists. Enter a unique IP address and retry.`

Recommended Action Enter a unique IP address and retry.

Error Message `EID-516: Invalid IP address. Enter a valid IP address in four decimal bytes (for example, 196.100.200.300) and retry.`

Recommended Action Enter a unique IP address that uses the specified format.

Error Message `EID-520: Database error: Error occurred while adding the new NE to the database.`

Recommended Action A database error occurred while adding the new NE. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry adding a new NE.

Error Message `EID-521: Network element description is too long. Restrict the description to 256 characters.`

Recommended Action Enter a description that does not exceed 256 characters.

Error Message `EID-524: Database error: Cannot set the In-Service time stamp in the database.`

Recommended Action A database error occurred while storing the NE's in-service time stamp in the database. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-525: Database error: Cannot set the Config Mode in the database.`

Recommended Action A database error occurred while setting the NE type in the database. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-526: Invalid tree node selected. You cannot perform this operation with the current selection. Select a group or domain node and retry.`

Recommended Action Select a group or domain node and retry.

Error Message `EID-527: Error occurred while registering with the Cisco MGM event notification subsystem. Exit and restart the application.`

Recommended Action Restart the Cisco MGM server and all of the clients. Contact Cisco technical support if the problem persists.

Error Message `EID-528: Fatal error occurred while notifying the` *`server_name`* `server of this change. Restart the server and all the clients.`

Recommended Action Restart the Cisco MGM server and all of the clients. Contact Cisco technical support if the problem persists.

Error Message `EID-529: An error occurred while writing data to the database.`

Recommended Action Exit and restart the Cisco MGM client.

Error Message `EID-530: An error occurred while reading data from the database.`

Recommended Action Exit and restart the Cisco MGM client.

Error Message `EID-531: A domain with the same name already exists. Specify a unique domain name and retry.`

Recommended Action Specify a unique domain name.

Error Message `EID-532: Database error: Cannot modify the domain description.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-533: Database error: Cannot modify the domain name.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-534: Domain Name is a mandatory field. Specify the domain name and retry.`

Recommended Action Enter a name for the domain.

Error Message `EID-535: Group Name is a mandatory field. Specify the group name and retry.`

Recommended Action Enter a name for the group.

Error Message `EID-536: Database error: Cannot modify the group name.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-537: Database error: Cannot modify the group description.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-538: Database error: Cannot modify the group location.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-539: Database error: Cannot modify the network element name.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-540: Database error: Cannot modify the network element IP address.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-541: Database error: Cannot modify the network element NSAP address.`

Recommended Action A database error occurred when you tried to modify the NE Network Service Access Point (NSAP) address. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-542: Database error: Cannot modify the network element state.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-543: Database error: Cannot modify the network element description.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-544: Database error: Cannot modify the network element community string.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-545: Database error: Cannot modify the network element location name.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-546: Database error: Cannot modify the network element GNE ID.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-549: Database error: Cannot set the NE type in the database.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-550: Database error: Cannot set the NE PM collection state in the database.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-551: Database error: Cannot set the model type in the database.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-552: Database error: Cannot set the NE username in the database.`

Recommended Action This error occurs when there is a database exception while setting the username for the NE in the NE Authentication tab. Perform the operation again.

Error Message `EID-553: Database error: Cannot set the NE user password in the database.`

Recommended Action This error occurs when there is a database exception while setting the username for the NE in the NE Authentication tab. Perform the operation again.

Error Message `EID-554: Database error: Cannot create the new user.`

Recommended Action Perform the operation again.

Error Message `EID-555: Username is a mandatory field. Enter a unique username and retry.`

Recommended Action Enter a unique username.

Error Message `EID-556: Username is a mandatory field. Enter a username and retry.`

Recommended Action Enter a unique username.

Error Message `EID-557: A MGM user with the same name already exists. Enter a unique username and retry.`

Recommended Action Enter a unique username.

Error Message `EID-559: User Password is a mandatory field. Enter a unique user password and retry.`

Recommended Action Enter a unique user password.

Error Message `EID-560: Enter a username with at least 6 characters.`

Recommended Action Enter a username that contains at least 6 characters.

Error Message `EID-561: Username must start with an alphabetic character (A - Z, a - z). Enter a valid username and retry.`

Recommended Action Enter a valid username.

Error Message `EID-563: User Password is mandatory to create a MGM user. Enter a unique user password and retry.`

Recommended Action Enter a unique user password.

Error Message `EID-564: The Add User wizard has been closed because the user privileges list has changed. Launch the wizard again.`

Recommended Action Relaunch the Create User Profile wizard.

Error Message `EID-565: User Password is a mandatory field. Enter a unique user password and retry.`

Recommended Action Enter a unique password for the user. The user password must contain at least six characters. Of those six characters, at least one must be a nonalphanumeric character (*, -, &, %, and so on).

Error Message `EID-566: Database error: Cannot modify user properties.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-567: The password confirmation does not match the actual password. Try again.`

Recommended Action Reenter the password.

Error Message `EID-568: The domain name cannot be the same as a group name. A group with the same name already exists. Specify a unique domain name and retry.`

Recommended Action Specify a unique domain name.

Error Message `EID-569: No objects are assigned to the user. Assign at least one object to the user.`

Recommended Action Assign an object to the user.

Error Message `EID-570: Database error: Cannot create the new user type.`

Recommended Action This error occurs when a new user profile is being created or if an existing profile is being modified. If it occurs while creating a user profile, delete the newly created user profile and try recreating the user profile again. If it occurs while modifying an existing user profile, perform the operation again.

Error Message `EID-571: User Type Name is a mandatory field. Enter a unique name and retry.`

Recommended Action Enter a unique user type name.

Error Message `EID-572: Database error: Cannot modify user properties.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-573: The password confirmation does not match the actual password. Reconfirm the password.`

Recommended Action Reconfirm the password.

Error Message `EID-574: A MGM user type with the same name already exists. Enter a unique name and retry.`

Recommended Action Enter a unique user type name.

Error Message `EID-574: One or more selected users are currently logged in. The users cannot be deleted until they log out.`

Recommended Action Ask the selected users to log out from all of the clients and retry.

Error Message `EID-575: No objects are assigned to the user. Assign at least one object to the user.`

Recommended Action Assign at least one object to the user and retry.

Error Message `EID-576: Enter a user type name that contains at least 6 characters.`

Recommended Action Enter a user type name that contains at least 6 characters.

Error Message `EID-576: Database error: Cannot assign ports to the user.`

Recommended Action A database error occurred during this operation. Verify that the Cisco MGM database is up and running properly. Restart the Cisco MGM client and retry.

Error Message `EID-577: Enter a user type name that contains at least 6 characters.`

Recommended Action Enter a user type name that contains at least 6 characters.

Error Message `EID-577: No ports are assigned to the user. Assign at least one port to the user.`

Recommended Action Assign one or more ports to the user.

Error Message `EID-578: Database error: Cannot delete one or more users.`

Recommended Action Perform the operation again.

Error Message `EID-579: Fatal error: Restart the server_name server and all the clients.`

Recommended Action Restart the Cisco MGM server and all of the clients.

Error Message `EID-580: One or more selected users are currently logged in. The users cannot be deleted until they log out.`

Recommended Action Ask the selected users to log out from all of the clients and retry.

Error Message `EID-581: User(s) with this profile already exist(s). The profile cannot be deleted until you delete the user(s) from the MGM User Table.`

Recommended Action Delete the user(s) from the Cisco MGM User Table.

Error Message `EID-582: This is a default user profile. It cannot be deleted.`

Recommended Action Select a different user profile to delete. You cannot delete the default user profile.

Error Message `EID-583: A GNE or NE with the same name already exists. Specify a unique GNE name and retry.`

Recommended Action Enter a unique GNE name.

Error Message `EID-585: The "to" IP Address is lower than the "from" IP Address.`

Recommended Action This error occurs during the addition of bulk NEs. Make sure that the To IP Address is greater than the From IP Address.

Error Message `EID-586: The selected GNE ID is no longer present. Select another GNE ID.`

Recommended Action This error occurs while adding an NE. If a selected GNE has been deleted by another user, this error message appears. Select a different GNE.

Error Message `EID-587: Database error: Cannot delete one or more user profiles.`

Recommended Action Database error occurred while checking for uniqueness of the user type name or deleting the user from the USER_TYPE_TABLE. It also occurred while writing rows in the OPERATIONS_PERMISSION_TABLE. Check your database connection.

Error Message `EID-587: The selected network partition ID is no longer present. Select another network partition ID.`

Recommended Action This error occurs while adding an NE. If a selected network partition has been deleted by another user, this error message appears. Select a different network partition under a different network partition.

Error Message `EID-590: Encountered database error after persisting privilege values.`

Recommended Action This error occurs when the privilege for the operation "Add Delete NE or Group" in the Add User Profile wizard or Modify User Profile wizard is changed from Read/Write to No Access or from No Access to Read/Write. Use the following procedure to correct the error:

Step 1 Change the privilege back to either Read/Write or No Access.

Step 2 Click **Finish**.

Step 3 Relaunch the wizard and set the privilege to the desired privilege.

Step 4 If the error shows again, check the database connectivity.

Error Message `EID-597: The last reference of a group can be deleted only after removing all the network elements it contains. Remove all the network elements this group contains and retry.`

Recommended Action Copy or move all of the NEs in this group to another group; then, retry.

Error Message `EID-598: A database error occurred while deleting the selected group from all references of its parent. The group might not be deleted completely.`

Recommended Action Restart the Cisco MGM client. Check if the deleted group still exists under all references of its parents. If it does, select each reference in the Domain Explorer Hierarchy pane and choose **Edit** > **Delete**.

Error Message `EID-600: Internal error: Cannot register with the event notification subsystem for events. You might not receive updates from other users.`

Recommended Action Restart the Cisco MGM client.

Error Message `EID-601: The Node View cannot be invoked for Out of Service network elements.`

Recommended Action This is an informational message. The Node View can be invoked only for in-service and under-maintenance NEs. No action is required.

Error Message `EID-602: The Alarm Browser cannot be invoked for the selected node.`

Recommended Action This is an informational message. No active alarm information is available for the selected node. No action is required.

Error Message `EID-603: An error occurred while subscribing to EMS events.`

Recommended Action Restart the Cisco MGM client.

Error Message `EID-604: An error occurred while unsubscribing from the Cisco Media Gateway Manager event notification subsystem.`

Recommended Action Restart the Cisco MGM client.

Error Message `EID-607: A GNE or NE with the same IP address already exists. Enter a unique IP address and retry.`

Recommended Action Enter a unique IP address.

Error Message `EID-621: Community String is a mandatory field. Enter the community string and retry.`

Recommended Action Enter the community string.

Error Message `EID-622: A fatal error occurred while requesting the topology change.`

Recommended Action Restart the Cisco MGM server and all of the clients.

Error Message `EID-623: An error occurred in response to a topology change. Refresh the view.`

Recommended Action Close, then reopen the topology window.

Error Message `EID-628: MGM initialization failed. Cannot connect to the MGM database.`

Recommended Action The Cisco MGM client cannot read a required table from the database. Restart the application and start the Debug Log (choose **File** > **Debug Options**). If the problem persists, contact Cisco technical support with the Debug Log trace.

Error Message `EID-629: A fatal error occurred while trying to retrieve new assignments from the server. The application will be shut down. Restart the application.`

Recommended Action Restart the Cisco MGM server and all of the clients.

Error Message `EID-630: The selected NE is not found in the database; the database might be corrupted.`

Recommended Action Restart the Cisco MGM client.

Error Message `EID-631: A user with administrator privileges has changed your password. The application will be closed. Log in again with the new password.`

Recommended Action Log in with the revised user password.

Error Message `EID-632: A user with administrator privileges has disabled this user. The application will be closed.`

Recommended Action The administrator disabled the selected user's access. Contact the administrator to re-enable user access.

Error Message `EID-633: The administrator has deleted this user. The application will be closed.`

Recommended Action The administrator deleted the selected user. Contact the administrator to create a new user account.

Error Message `EID-637: One or more NEs are missing from the domain. Those NEs will be added to the Lost and Found group in the MGM domain.`

Recommended Action No action is required. The missing NE has been added to the Lost and Found group in the Cisco MGM domain.

Error Message `EID-638: A MGM administrator has modified the MGM domain. As a result, your request to modify the MGM topology is invalid. Try again.`

Recommended Action While you were adding an NE or group to an existing group, another administrator deleted the existing group. Consequently, your request to add an NE or group is now invalid. Reselect the node and retry.

Error Message `EID-639: One or more groups are missing from the domain. Those groups will be added to the Lost and Found group in the MGM domain.`

Recommended Action No action is required. The missing group has been added to the Lost and Found group in the Cisco MGM domain.

Error Message `EID-640: Searched item not found.`

Recommended Action Repeat the search with new search criteria.

Error Message `EID-642: Database error: Cannot paste the requested node.`

Recommended Action Try the paste action again. If the problem persists, contact Cisco technical support.

Error Message `EID-643: Database error: Cannot delete the requested node.`

Recommended Action Delete the node again. If the problem persists, contact Cisco technical support.

Error Message `EID-644: Database error: Cannot undelete the requested node.`

Recommended Action Undelete the node again. If the problem persists, contact Cisco technical support.

Error Message `EID-645: Cannot purge the requested NE. Action failed.`

Recommended Action An NE can be purged only if it is out of service. If the operational state of the NE is not out of service, undelete the NE, mark it out of service, and delete it again. Try to purge the NE again.

Error Message `EID-646: Cannot add the new NE. An NE with the same name or IP address still exists in the MGM domain. Contact Cisco TAC for support.`

Recommended Action Contact Cisco technical support.

Error Message `EID-647: Object cannot be copied because the source and destination are the same.`

Recommended Action Specify a different source and destination.

Error Message `EID-649: A duplicate target is not allowed.`

Recommended Action Specify a target that has not been used before.

Error Message `EID-650: Specify a target.`

Recommended Action Specify a target.

Error Message `EID-651: Target cannot contain` *`string`*.

Recommended Action Specify a target that does not contain this string.

Error Message `EID-652: Target must contain 4 dot-separated integers.`

Recommended Action Specify a target that contains 4 dot-separated integers.

Error Message `EID-653: Target is invalid.`

Recommended Action Specify a valid target.

Error Message `EID-654: Retry values must be integers between 0 and 5.`

Recommended Action Specify the retry value as an integer between 0 and 5.

Error Message `EID-655: Timeout values must be integers between 1 and 60.`

Recommended Action Specify the timeout as an integer between 1 and 60.

Error Message `EID-656: Specify a write string.`

Recommended Action Specify a write string.

Error Message `EID-657: Error retrieving Flash partition files.`

Recommended Action Contact the system administrator.

Error Message `EID-658: Rediscover request has been accepted.`

Recommended Action Your rediscover request was accepted; no action is required.

Error Message `EID-662: Power level refresh failed.`

Recommended Action Connection to the device might have timed out. Contact your system administrator.

Error Message `EID-663: Circuit ID length cannot exceed 64 characters.`

Recommended Action Enter a circuit ID that does not exceed 64 characters.

Error Message `EID-664: Circuit description cannot exceed 256 characters.`

Recommended Action Enter a circuit description that does not exceed 256 characters.

Error Message `EID-665: Config exception: Cannot change EMS identification.`

Recommended Action Enter an EMS ID that has between 1 and 64 characters and does not contain an apostrophe (‘), a semicolon (;), a colon (:), or a comma (,).

Error Message `EID-667: Network Partition ID is a mandatory field. Enter a unique network partition ID and retry.`

Recommended Action Enter a unique network partition ID.

Error Message `EID-668: A network partition with the same ID already exists. Specify a unique network partition ID and retry.`

Recommended Action Enter a unique network partition ID.

Error Message `EID-671: An error occurred while changing the network partition.`

Recommended Action This error occurs while changing the name of the network partition. Retry changing the network partition name.

Error Message `EID-672: Invalid browser path.`

Recommended Action Verify that a browser is installed on your system and that the browser path in ems-client.cfg is set correctly.

Error Message `EID-673: Network Partition Description is a mandatory field. Enter a unique network partition description and retry.`

Recommended Action Enter a unique network partition description.

Error Message `EID-675: Cannot export data on {0}.`

Recommended Action A critical malfunction occurred on the property sheet; the data cannot be exported. Contact Cisco technical support.

Error Message EID-676: Some of the data was not exported correctly. See the file *filename* for details.

Recommended Action A malfunction occurred while displaying data in the property sheet. A parameter cannot be exported, but the export operation will continue processing other parameters. Contact Cisco technical support.

Error Message EID-677: Cannot execute the operation. Another NE configuration report is in progress.

Recommended Action Wait until the report is finished and repeat the operation.

Error Message EID-678: Error: Cannot export some of the data in the *tab_name* tab.

Recommended Action A malfunction occurred while displaying data in the property sheet. A parameter cannot be exported, but the export operation will continue processing other parameters. Contact Cisco technical support.

Error Message EID-690: A similar job is currently in progress. Wait for the job to finish; then, try again.

Recommended Action No action is required.

Error Message EID-691: Cannot add the new GNE. A GNE with the same name or IP address still exists in the MGM domain. Contact Cisco TAC for support.

Recommended Action Contact Cisco technical support.

Error Message EID-692: No circuit sizes are assigned to the user. Assign at least one circuit size to the user.

Recommended Action Assign at least one circuit size to the user.

Error Message EID-693: Cannot purge the requested NE because it is connected to another node with a link.

Recommended Action This error occurs when you purge an NE that has links to other NEs. Delete all links associated with this NE and retry the purge operation.

Error Message EID-694: Cannot move the requested NE because it is connected to another node in the same network partition with a link. Delete all links before changing the partition.

Recommended Action Delete all of the links before moving the NE to another partition.

Error Message `EID-700: An error occurred while saving node coordinates to the database. Refresh the view and retry.`

Recommended Action Click the **Refresh Data** tool to refresh the view and recustomize the coordinates.

Error Message `EID-701: An error occurred while saving the node icon to the database. Refresh the view and retry.`

Recommended Action Click the **Refresh Data** tool to refresh the view and recustomize the node icons.

Error Message `EID-703: An error occurred while creating the new link between the selected nodes. Recreate the link.`

Recommended Action Recreate the link.

Error Message `EID-704: Links must be created between two distinct nodes of compatible type on the same network map. Recreate the link.`

Recommended Action Recreate the link between two distinct nodes.

Error Message `EID-705: An error occurred while deleting selected link(s). Check the communication status of the source and destination nodes.`

Recommended Action Click the **Refresh Data** tool to refresh the view and attempt to delete the link again.

Error Message `EID-709: An error occurred while opening the selected image file at the specified file path.`

Recommended Action The selected image file does not exist in the selected file path. Select an image file from the file list in the selected subdirectory.

Error Message `EID-710: An error occurred while loading the node icon image. Retry.`

Recommended Action The image could not be loaded from the file you selected. Check the size of the file and reload the icon image. The size of the map file should not exceed 100 KB.

Error Message `EID-711: An error occurred while loading the default background map image.`

Recommended Action Exit the Cisco MGM client and retry. If the error persists, some map images were deleted. Reinstall the Cisco MGM client.

Error Message `EID-712: An error occurred while loading the link from the database.`

Recommended Action Restart the Network Map. If the error persists, exit the Cisco MGM client and retry.

Error Message `EID-713: An error occurred while opening the node.`

Recommended Action Restart the Network Map. If the error persists, exit the Cisco MGM client and retry.

Error Message `EID-714: An error occurred while opening the parent node.`

Recommended Action Restart the Network Map. If the error persists, exit the Cisco MGM client and retry.

Error Message `EID-715: An error occurred while loading the background map image file. Retry.`

Recommended Action The image could not be loaded from the file you selected. Check the size of the file and reload the background image. The size of the map file should not exceed 100 KB.

Error Message `EID-716: An error occurred while deleting a node from the map. Refresh the view and retry.`

Recommended Action Click the **Refresh Data** tool to refresh the view.

Error Message `EID-717: An error occurred while saving the map background image file. Refresh the view and retry.`

Recommended Action The image could not be saved to the database. Click the **Refresh Data** tool to refresh the view and recustomize the background image. If the problem persists on a Solaris workstation, check the file permissions for the map background and map icon subdirectories under your installed subdirectory.

Error Message `EID-718: You cannot delete the selected link(s) because they are autodiscovered link(s). Action failed.`

Recommended Action You selected an autodiscovered link that is not in an “Invalid” state, and therefore cannot be deleted. You can delete only manual or invalid links.

Error Message `EID-721: Links must be created between two nodes that are in service and available. Recreate the link.`

Recommended Action Recreate the link.

Error Message `EID-722: Circuits must be created between two nodes that are in service and available. Recreate the circuit.`

Recommended Action Recreate the circuit.

Error Message `EID-723: Links cannot be created between two offview nodes. Recreate the link.`

Recommended Action Recreate the link.

Error Message `EID-724: Exception occurred while launching the Circuit Table.`

Recommended Action An error occurred while launching the Circuit Table. Try to relaunch the Circuit Table.

Error Message `EID-725: Enter a valid link name with 1 to 256 characters.`

Recommended Action Enter a valid link name that contains 1 to 256 characters.

Error Message `EID-726: Enter a valid link description with 1 to 256 characters.`

Recommended Action Enter a valid link description that contains 1 to 256 characters.

Error Message `EID-727: Enter a valid link name with 1 to 64 characters and a link description with 1 to 256 characters.`

Recommended Action Enter a valid link name and link description.

Error Message `EID-728: There is no support for this model yet.`

Recommended Action The network element software version is not supported. Contact Cisco's Technical Support for more information.

Error Message `EID-731: Action was not completed or was partially completed.`

Recommended Action A link already exists with the same name. Create a link with a unique name.

Error Message `EID-732: Source and destination nodes cannot be the same. Choose a different destination node.`

Recommended Action Choose a different destination node.

Error Message EID-733: The node is not available or there are no available physical termination points for the given link size.

Recommended Action All link termination points have links for the specified link size. Delete existing links and perform the operation again.

Error Message EID-735: Create link action was not completed or was partially completed for link: *link_ID*.

Recommended Action A link already exists with the same name. Create a link with a unique name.

Error Message EID-736: Modify link action was not completed or was partially completed for link: *link_ID*.

Recommended Action A link already exists with the same name. Create a link with a unique name.

Error Message EID-738: Cannot create a link with link name *name*. Verify that both source and destination NEs are in the same network partition.

Recommended Action Verify that both the source and destination NEs belong to the same network partition.

Error Message EID-739: Cannot retrieve possible link sizes or link protection information.

Recommended Action Cannot retrieve possible link sizes on the node. Check if the node is In Service.

Error Message EID-740: A link is already created with this PTP. Enter a different PTP value to proceed.

Recommended Action Enter a different Physical Termination Point (PTP) value.

Error Message EID-741: Error occurred while retrieving PTP information through CORBA for the unmanaged NE.

Recommended Action CORBA exception occurred. Check if the node is In Service. For more information, contact Cisco's Technical Support.

Error Message EID-742: The Link Rate/Protection Type selected is not supported by UnmanagedNE. Choose 'Not Applicable' and recreate the link.

Recommended Action Select Not Applicable as the link rate or protection type and retry. If the problem persists, contact Cisco technical support.

Error Message `EID-800: Selected NEs are invalid or unreachable.`

Recommended Action This error occurs because all NEs under a group are in service or under maintenance but are not reachable, or because the NEs are reachable but in different network partitions. Make sure that the selected NEs are in the same network partition.

Error Message `EID-801: None of the NEs contain ML cards or all ML cards are used for L2 topology.`

Recommended Action This error occurs if there are no ML cards with both POS ports available for the NEs selected during Resilient Packet Ring (RPR) circuit creation. Make sure that all ML cards used for topology creation are available.

Error Message `EID-806: A topology with the same name already exists. Enter a unique topology name.`

Recommended Action Enter a unique topology name.

Error Message `EID-807: A circuit with the same name already exists. Enter a unique circuit name.`

Recommended Action Enter a unique circuit name.

Error Message `EID-811: Topology name is empty. Enter a topology name.`

Recommended Action Enter a topology name.

Error Message `EID-812: Topology between ports on the same card is not allowed.`

Recommended Action Create a topology between ports on different cards.

Error Message `EID-813: Select at least two NEs.`

Recommended Action Select at least two NEs.

Error Message `EID-814: Select at least two cards.`

Recommended Action Select at least two cards.

Error Message `EID-815: Select at least one card per NE.`

Recommended Action Select at least one card per NE.

Error Message `EID-816: Select a topology to modify.`

Recommended Action Select a topology to modify.

Error Message `EID-817: Select a topology to delete.`

Recommended Action Select a topology to delete.

Error Message `EID-833: Invalid source or destination selected for routing.`

Recommended Action Select a valid source or destination.

Error Message `EID-834: Error retrieving topology segments from server.`

Recommended Action This error occurs because the server is still initializing. Close the wizard and perform the operation again after some time.

Error Message `EID-835: Invalid topology segment.`

Recommended Action Select a valid topology segment.

Error Message `EID-836: Segment is already provisioned.`

Recommended Action Select an unprovisioned segment.

Error Message `EID-853: For L2 Service Creation on RPR Topology - Please select minimum two drops on two different M-cards.`

Recommended Action Select at least two drops on two different ML-series cards that are in RPR topology.

Error Message `EID-854: For L2 Service Creation on Point-to-Point Topology - Please select at least one drop per M-card.`

Recommended Action Select at least one drop per ML-series card that is in a point-to-point topology.

Error Message `EID-855: No front ports exist for the selected topology.`

Recommended Action All of the front ports are used up. Delete drops or L2 services that are not used to free up some front ports.

Error Message `EID-856: Error in retrieving front ports for the selected topology.`

Recommended Action All of the front ports are used. Delete drops or L2 services that are not used to free up some front ports.

Error Message `EID-857: Failed to provision L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the L2 service wizard and try again. Check the command-line interface (CLI) configuration on all ML-series cards in the topology and retry the operation. If the problem persists, contact Cisco technical support.

Error Message `EID-859: Failed to modify L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the L2 service wizard and try again. Check the CLI configuration on all ML-series cards in the topology and retry the operation. If the problem persists, contact Cisco technical support.

Error Message `EID-860: Failed to add drops to L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the Add/Delete Drops wizard and try again. Check the CLI configuration on all ML-series cards in the topology and retry the operation.

Error Message `EID-861: Failed to add drops to L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the Add/Delete Drops wizard and try again. Check the CLI configuration on all ML-series cards in the topology and retry the operation.

Error Message `EID-862: No L2 service is selected to modify drops. Select an L2 service.`

Recommended Action Select an L2 service.

Error Message `EID-863: Select only one L2 service from the table.`

Recommended Action Select one L2 service.

Error Message `EID-865: No L2 service is selected to modify. Select an L2 service.`

Recommended Action Select one L2 service.

Error Message `EID-866: Select only one L2 service from the table.`

Recommended Action Select one L2 service.

Error Message `EID-868: No L2 service is selected to show drops. Select an L2 service.`

Recommended Action Select one L2 service.

Error Message `EID-869: Select only one L2 service from the table.`

Recommended Action Select one L2 service.

Error Message `EID-871: PIR should be greater than or equal to CIR.`

Recommended Action Enter a PIR value that is greater than or equal to CIR.

Error Message `EID-872: Max PIR burst should be greater than or equal to max CIR burst.`

Recommended Action Enter a PIR that is greater than or equal to the maximum CIR burst.

Error Message `EID-873: Failed to modify drops on the L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the Add/Delete Drops wizard and try again. Check the CLI configuration on all ML-series cards in the topology and retry the operation.

Error Message `EID-874: Failed to modify these drops on the L2 service.`

Recommended Action If the topology is not synchronized, close the L2 service wizard and try again after the topology synchronization is complete. If there is an invalid username or password, make sure that the username and password configured in the ML-series card are synchronized with the NE username and password. Close the Add/Delete Drops wizard and try again. Check the CLI configuration on all ML-series cards in the topology and retry the operation.

Error Message `EID-875: Please select at least one drop to delete.`

Recommended Action Select at least one drop to delete to complete the delete drop port operation. Otherwise, cancel the delete drop port operation.

Error Message `EID-876: Please select at least one new drop to add.`

Recommended Action Select at least one drop to add to complete the add drop port operation. Otherwise cancel the add drop port operation.

Error Message `EID-878: Failed to Reset General attributes of L2 Service.`

Recommended Action Close the modify L2 service window and try again.

Error Message `EID-879: Failed to Reset QoS values for L2 Service.`

Recommended Action Close the modify L2 service window and try again.

Error Message `EID-880: Failed to Reset Enable/Disable value for the drops in the L2 Service.`

Recommended Action Close the modify L2 service window and try again.

Error Message `EID-883: L2 Topology is undergoing Resync. Please wait until the L2 Topology Resync is completed.`

Recommended Action Wait until the topology resync has completed before starting the operation.

Error Message `EID-884: L2 Topology is in Incomplete state.`

Recommended Action Selected topology is incomplete. Complete the topology by creating missing circuits. Try the operation again after completing the topology.

Error Message `EID-885: There are no Mcards in the topology.`

Recommended Action Add the ML-series cards to the topology and wait until the topology is completed. Wait until the topology resynchronization status becomes complete. If the problem persists, contact Cisco technical support.

Error Message `EID-902: Failed to set the circuit attributes.`

Recommended Action Cisco MGM enforces the uniqueness of the circuit ID. Change the circuit name and retry.

Error Message `EID-903: Circuit Name is a mandatory field. Enter a valid circuit name with 1 or more characters and retry.`

Recommended Action Enter a circuit name.

Error Message `EID-904: Failed to set the circuit end points for circuit creation.`

Recommended Action The server service is not ready. Wait several minutes and try again.

Error Message `EID-905: Source is not fully specified.`

Recommended Action Specify the source NE and connection termination points (CTPs).

Error Message `EID-906: Destination is not fully specified.`

Recommended Action Specify the destination NE and CTPs.

Error Message `EID-907: Slot selection is mandatory. Select the slot and retry.`

Recommended Action Select a slot and retry.

Error Message `EID-908: Port selection is mandatory. Select the port and retry.`

Recommended Action Select a port and retry.

Error Message `EID-909: STS/VT selection is mandatory. Select the STS or VT and retry.`

Recommended Action Select an STS or VT and retry.

Error Message `EID-910: Sec. slot selection is mandatory. Select the slot and retry.`

Recommended Action Select a secondary slot and retry.

Error Message `EID-911: Sec. port selection is mandatory. Select the port and retry.`

Recommended Action Select a secondary port and retry.

Error Message `EID-912: Sec. STS/VT selection is mandatory. Select the STS or VT and retry.`

Recommended Action Select a secondary STS or VT and retry.

Error Message `EID-913: Failed to retrieve slots.`

Recommended Action The server service is not ready. Wait several minutes and try again.

Error Message `EID-914: Failed to retrieve ports.`

Recommended Action Verify that there are available in-service ports on the selected slot.

Error Message `EID-915: Failed to retrieve STSs.`

Recommended Action The server service is not ready. Wait several minutes and try again.

Error Message `EID-916: Failed to retrieve VTs.`

Recommended Action Verify that there are available in-service VTs on the selected STS.

Error Message `EID-917: Sources cannot be the same.`

Recommended Action You cannot select the same CTPs for the source and secondary source. Select a different source or secondary source and retry.

Error Message `EID-918: Destinations cannot be the same.`

Recommended Action You cannot select the same CTPs for the destination and secondary destination. Select a different destination or secondary destination and retry.

Error Message `EID-919: Source and destination CTPs cannot be identical.`

Recommended Action You cannot select the same CTPs for the source and destination.

Error Message `EID-920: Failed to retrieve adjacent nodes for the current nodes.`

Recommended Action Verify that there is at least one link between the selected nodes.

Error Message `EID-921: Failed to retrieve links between the current node and the adjacent node.`

Recommended Action Verify that there is at least one link between the selected nodes.

Error Message `EID-927: Failed to provision circuit manually.`

Recommended Action The selected link does not exist. The link might have been deleted. Reopen the Circuit wizard and create the circuit.

Error Message `EID-928: Span already added for the selected link.`

Recommended Action A span has been added for the current hop. If you want to add a new span, remove the existing span and add the new one.

Error Message `EID-929: Select a span in the current hop.`

Recommended Action Select a span in the current hop.

Error Message `EID-930: No available` *`object`*`.`

Recommended Action All of the objects are in use for the selected link.

Error Message `EID-931: Failed to provision circuit.`

Recommended Action The underlying circuit is not in the correct state. The circuit must be in a Creating or Active state. Reopen the Circuit wizard and try again.

Error Message `EID-932: Failed to route circuit.`

Recommended Action The server is not ready. Wait several minutes; then, reopen the Circuit wizard and try again.

Error Message `EID-934: Failed to add drops.`

Recommended Action The underlying circuit might have been deleted. Reopen the Circuit wizard and try again.

Error Message `EID-935: Failed to set the circuit end points for editing.`

Recommended Action Source or destination end points are already in use. Reopen the Circuit wizard and try again.

Error Message `EID-936: Failed to retrieve the connection information.`

Recommended Action Verify that there is at least one link between the selected nodes.

Error Message `EID-937: Failed to retrieve the nodes in the working and protect paths.`

Recommended Action Verify that the nodes are in service in the Domain Explorer.

Error Message `EID-938: Failed to retrieve the links in the working path.`

Recommended Action Verify that there are links in the working path and that the nodes are in service.

Error Message `EID-939: Failed to retrieve the links in the protect path.`

Recommended Action Verify that there are links in the protect path and that the nodes are in service.

Error Message `EID-940: Invalid circuit attributes. Select a circuit with valid attributes.`

Recommended Action Select a circuit with a valid source and destination and an active state.

Error Message `EID-941: Cannot launch trace report because the source and destination are the same.`

Recommended Action The trace report shows both the primary and the secondary routes that are taken by the circuit. Because the source and destination are the same, there is no route.

Error Message `EID-942: Delete job already in progress on the selected circuit(s). Wait until the job completes.`

Recommended Action You cannot delete this circuit because the delete request has been submitted on this circuit already.

Error Message `EID-943: Circuit deletion failure.`

Recommended Action Cisco MGM reports this error message if any associated cross-connections from the NEs could not be deleted. Cisco MGM places the circuit in an Incomplete state. Try to delete this circuit again or take the appropriate action described by the failure event.

Error Message `EID-943: Circuits involving ML cards cannot be deleted. Delete associated topologies.`

Recommended Action Delete the associated topologies.

Error Message `EID-944: Delete drop failure.`

Recommended Action Click the **Refresh Data** tool to refresh the list of existing drops. Wait for the circuit to change to the ACTIVE or DROP_PENDING state and try again. Alternately, the node might be down or initializing. Wait for the node to come up or finish its initialization and try again.

Error Message `EID-945: No adjacent nodes for the selected node.`

Recommended Action Verify that there is at least one link from the selected node to the other nodes.

Error Message `EID-946: No available links between the selected nodes.`

Recommended Action Verify that there is at least one link between the selected nodes.

Error Message `EID-947: Editing the UPSR attributes failed.`

Recommended Action No action is required.

Error Message `EID-947: Editing the SNCP attributes failed.`

Recommended Action Contact your system administrator.

Error Message `EID-948: Change the circuit name and retry.`

Recommended Action Enter a unique circuit name.

Error Message `EID-949: Number of circuits must be greater than or equal to 1. Enter a valid number and retry.`

Recommended Action Enter a value that is greater than or equal to 1.

Error Message `EID-950: Failed to upgrade the selected circuit(s).`

Recommended Action Select another circuit. Only circuits that are in an upgradable state can be upgraded. Wait for the source node to be discovered.

Error Message `EID-951: Cannot upgrade the selected circuit because it is not in an upgradeable state.`

Recommended Action Select another circuit that is in an upgradeable state.

Error Message `EID-952: Failed to delete stitched nodes.`

Recommended Action Circuit is not complete or not in an active state. Wait for each node involved in the circuit to be discovered.

Error Message `EID-953: Failed to add nodes.`

Recommended Action Circuit is not complete or not in an active state. Wait for each node involved in the circuit to be discovered.

Error Message `EID-954: Failed to retrieve the circuit provisioner.`

Recommended Action The server service is not ready. Wait several minutes and try again.

Error Message `EID-955: Failed to retrieve the possible Ethernet nodes.`

Recommended Action Wait for each node involved in the circuit to be discovered.

Error Message `EID-958: Failed to change the circuit name.`

Recommended Action Check if the Cisco MGM server is up and running. The Cisco MGM server service might not be available for some time. Try again. You should also verify that the circuit name is unique.

Error Message `EID-959: Failed to change the circuit description.`

Recommended Action Check if the Cisco MGM server is up and running. Try again when the server is available.

Error Message `EID-960: Failed to change the circuit state.`

Recommended Action Check if the Cisco MGM server is up and running. Try again when the server is available.

Error Message `EID-961: The circuit name already exists. Enter a unique circuit name.`

Recommended Action Enter unique circuit name.

Error Message `EID-962: No active NEs are available.`

Recommended Action Launch the Circuit Table only on NEs available for circuit creation.

Error Message `EID-963: Circuit is incomplete cannot be traced.`

Recommended Action Launch a circuit trace for active circuits only.

Error Message `EID-964: The requested search criteria did not return any data.`

Recommended Action Modify the search criteria.

Error Message `EID-967: Failed to change the customer ID.`

Recommended Action Verify that the Cisco MGM server is up and running.

Error Message `EID-968: Failed to change the service ID.`

Recommended Action Verify that the Cisco MGM server is up and running.

Error Message `EID-969: The source NE of this circuit is not in the user domain.`

Recommended Action Verify that the source NE is in the user domain.

Error Message `EID-971: Failed to retrieve TUG2s.`

Recommended Action Verify that there are available in-service TUG2s on the selected VC3.

Error Message `EID-971: When 'Ignore All Circuit Names' is not selected, at least one circuit name must be added to the Selected Names list.`

Recommended Action Add at least one circuit name to the Selected Names list.

Error Message `EID-972: Failed to retrieve VC12s.`

Recommended Action Verify that there are available in-service VC12s on the selected object.

Error Message `EID-972: When 'Ignore All Customer IDs' is not selected, at least one customer ID must be added to the Selected Names list.`

Recommended Action Add at least one customer ID to the Selected Names list.

Error Message `EID-973: When 'Ignore All Service IDs' is not selected, at least one service ID must be added to the Selected Names list.`

Recommended Action Add at least one service ID to the Selected Names list.

Error Message `EID-976: No NEs selected or the selected NEs are not in service.`

Recommended Action Select valid NEs.

Error Message `EID-977: Error occurred while retrieving NE data provider.`

Recommended Action Contact your system administrator.

Error Message `EID-981: Failed to change the circuit parameters.`

Recommended Action Contact your system administrator.

Error Message `EID-982: Failed to retrieve the monitor source points.`

Recommended Action Contact your system administrator.

Error Message `EID-983: Cannot create monitor circuits on a port grouping circuit.`

Recommended Action No action.

Error Message `EID-984: Error occurred while retrieving the circuit drop points.`

Recommended Action Contact your system administrator.

Error Message `EID-985: Error occurred while retrieving the circuit drop nodes.`

Recommended Action Contact your system administrator.

Error Message `EID-986: Cannot create drops on the circuit. Additional drops are not available.`

Recommended Action No action.

Error Message `EID-987: There are no possible Ethernet nodes to add.`

Recommended Action No action.

Error Message `EID-988: Cannot create monitor circuits on this termination point.`

Recommended Action No action.

Error Message `EID-1001: Failed to retrieve circuit service provider object.`

Recommended Action Verify that the Cisco MGM server and the database is up and running.

Error Message `EID-1002: Failed to retrieve Sys ID for the NE.`

Recommended Action The NEs are not present in the system. Make the NE active and try again.

Error Message `EID-1003: Both old and new MAC addresses are mandatory.`

Recommended Action Enter both values.

Error Message `EID-1004: Failed to retrieve circuit manager object.`

Recommended Action Verify that the Cisco MGM server is up and running.

Error Message `EID-1011: Failed to retrieve network manager object.`

Recommended Action Verify that the Cisco MGM server is up and running.

Error Message `EID-1012: Failed to retrieve path trace mode.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1013: Failed to retrieve transmit text.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1014: Failed to retrieve expected text.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1015: Failed to retrieve received text.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity. Verify that the provisioned card is present in the slot.

Error Message `EID-1016: Failed to set transmit text.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1017: Failed to set expected text.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1018: Failed to set path trace mode.`

Recommended Action Verify that the Cisco MGM server is up and running. Check the NE connectivity.

Error Message `EID-1019: No circuit selected for J1 path trace. Select a circuit.`

Recommended Action Select an active STS (for SONET) or active LOP/HOP/VCT (for SDH).

Error Message `EID-1020: Select only one circuit from the table.`

Recommended Action Select only one active STS (for SONET) or active LOP/HOP/VCT (for SDH).

Error Message `EID-1021: Failed to retrieve the record from the database.`

Recommended Action Verify that Cisco MGM server and database is up and running.

Error Message `EID-1022: Circuit is not active.`

Recommended Action Select an active STS (for SONET) or active LOP/HOP/VCT (for SDH).

Error Message `EID-1065: Error creating ring Provisioner: Could get data for the selected ring.`

Recommended Action Check the connectivity for all NEs in the BLSR. Mark the NEs in the ring as Out of Service and In Service.

B.2 Cisco MGM Server Error Messages

Cisco MGM server error messages appear in the Error Log and have the following syntax:

Date time: *filename(line number)*: *module-severity-error_ID*: *error_message*

Example:

```
01/01/03 09:56:01 PM: cliroutines.c(80): CONFIG-DEBUG-1201: Unknown_ETHERNET_PORT 0
```

The following error messages are categorized by severity (critical, major, minor, and debug) and are listed in ascending numeric order within each category.

Note Because error messages are grouped in number ranges, they are not listed in exact numeric order.

B.2.1 Critical Server Error Messages

Error Message `EID-104: Service service_name failed to initialize.`

Recommended Action Look for previous error messages from the service that failed to determine the cause and fix for the problem. Verify that the Oracle database is running and that there are enough free resources (memory, sockets, and so on) on the server workstation.

Error Message `EID-316: Error connecting to the database.`

Recommended Action The application failed to log into the Oracle database. Verify that the database and the listeners are running.

Error Message `EID-401: Failed to initialize UDP socket pool.`

Recommended Action There were not enough sockets available for the server to start. Check the /etc/system file on the server workstation for the following lines:

```
set rlim_fd_max=XXX
set rlim_fd_cur=YYY
```

The value of *XXX* should be greater than or equal to 4096. The value of *YYY* should be greater than or equal to 2048. Adjust the value; then, restart the server workstation.

Error Message `EID-402: Failed to initialize work queue.`

Recommended Action Restart the server.

Error Message `EID-403: Failed to initialize semaphores.`

Recommended Action Restart the server.

Error Message `EID-404: Unable to connect to database.`

Recommended Action The application failed to log into the Oracle database. Verify that the database and the listeners are running. There might be a license problem. Also, verify that the username and password are correct.

Error Message `EID-405: Failed to start main poller thread.`

Recommended Action Restart the server.

Error Message `EID-601: Failed to open trap listener socket.`

Recommended Action The UDP socket 162 should not be taken by another program. If another program is using UDP socket 162, stop that program. Also, verify that the Cisco MGM server is running as root.

Error Message `EID-602: Failed to bind trap listener socket.`

Recommended Action There is a conflict for the UDP socket. Stop the conflicting UNIX process or reboot the Cisco MGM server.

Error Message `EID-701: Failed to get memory for SNMP packet.`

Recommended Action Restart the Cisco MGM server. If the problem persists, add memory to the workstation.

Error Message `EID-702: Failed to open SNMP port.`

Recommended Action There is a conflict for the UDP socket. Stop the conflicting UNIX process or reboot the Cisco MGM server.

Error Message `EID-703: Failed to bind SNMP socket.`

Recommended Action There is a conflict for the UDP socket. Stop the conflicting UNIX process or reboot the Cisco MGM server.

Error Message `EID-805: Failed to open a disk file` *`filename`* `errno=`*`error_number_from_file /usr/include/sys/errno.h`*`.`

Recommended Action Cisco MGM could not open SpoolFile in the MGMSHOME directory. Check for file permissions and verify that the Cisco MGM server is running with SuperUser privileges. The file system containing SpoolFile must be installed on a local file system.

Error Message `EID-1024: Failed to retrieve trace data from the server.`

Recommended Action Try again after some time. If the problem persists, contact your system administrator.

Error Message `EID-1025: Could not get access to one of the circuit nodes. Verify that you have user privileges for all of the nodes in this circuit. Contact the administrator if the problem persists.`

Recommended Action Verify that you have user privileges for all the nodes in the circuit. If the problem persists, contact your system administrator.

Error Message `EID-1026: This circuit has been deleted from another interface. This window will close.`

Recommended Action No action.

Error Message `EID-1026: Roll creation request failed.`

Recommended Action Try again. Contact system administrator for more information.

Error Message `EID-1027: Error: Cannot proceed with roll creation.`

Recommended Action Close the wizard and try again.

Error Message `EID-1028: Error occurred while setting the roll-to-point. Try again.`

Recommended Action Perform the operation again.

Error Message `EID-1029: Roll-to-point is not fully specified. Choose available points.`

Recommended Action Choose available points.

Error Message `EID-1030: Select the circuit termination point.`

Recommended Action Select the circuit termination point.

Error Message `EID-1031: The selected roll path is invalid.`

Recommended Action Choose a valid circuit termination point as the roll path.

Error Message `EID-1032: Failed to complete the roll.`

Recommended Action Contact your system administrator.

Error Message `EID-1033: Failed to delete the roll.`

Recommended Action Contact your system administrator.

Error Message `EID-1034: Failed to cancel the roll.`

Recommended Action Contact your system administrator.

Error Message `EID-1035: Failed to finish the roll.`

Recommended Action Contact your system administrator.

Error Message `EID-1036: Failed to retrieve LAP spans.`

Recommended Action Contact your system administrator.

Error Message `EID-1037: Failed to retrieve LO options.`

Recommended Action Contact your system administrator.

Error Message `EID-1038: Failed to set LO options.`

Recommended Action Contact your system administrator.

Error Message `EID-1039: Failed to set the LAP destination.`

Recommended Action Contact your system administrator.

Error Message `EID-1040: Error occurred while setting the nodes.`

Recommended Action Contact your system administrator.

Error Message `EID-1050: This port is already assigned. The east and west ports must be different.`

Recommended Action Choose another port.

Error Message `EID-1051: You cannot create a BLSR with these attributes. This means that all nodes and spans in your network have been excluded. Click the "Excluded nodes" button to see a list of nodes and why they cannot be included in the BLSR you are creating.`

Recommended Action To correct this error:

Step 1 Click **Ok** in the warning dialog box. The Working Span Selection dialog box appears with an empty map.

Step 2 Click **Excluded Nodes**. The Excluded Nodes dialog box appears. It lists all the nodes excluded from the ring creation and the reasons for excluding them.

Step 3 Correct the problem and perform the operation again.

Step 4 If the problem persists, contact the system administrator.

Error Message `EID-1052: Error occurred while adding the span.`

Recommended Action Click the **Details** button to view the reason why the span was not added. If reason is "not sufficient," contact your system administrator.

Error Message `EID-1053: Error occurred while removing the span.`

Recommended Action The **Details** button shows the reason for not removing the span. Review the reasons. If the problem persists, contact Cisco technical support.

Error Message `EID-1054: Error occurred while reversing the span.`

Recommended Action The **Details** button shows the reason for not reversing the span. Review the reasons. If the problem persists, contact Cisco technical support.

Error Message `EID-1055: Error occurred while setting the protect ports.`

Recommended Action Click the **Details** button to view the reason for the failure. Correct the error and retry or contact your system administrator.

Error Message `EID-1056: Error occurred while retrieving the working spans for the map update.`

Recommended Action The ring model might not exist in the server. Close the table; then, relaunch it and try to upgrade again.

Error Message `EID-1057: Error provisioning.`

Recommended Action Click the **Details** button to view the reason why provisioning failed. Correct the problem and retry. If the problem persists, contact your system administrator.

Error Message `EID-1058: Error updating.`

Recommended Action Click the **Details** button to view the reason why the update failed. Correct the problem and retry. If the problem persists, contact your system administrator.

Error Message `EID-1059: Error editing.`

Recommended Action Click the **Details** button to view the reason why the edit failed. Correct the problem and retry. If the problem persists, contact your system administrator.

Error Message `EID-1060: Error deleting.`

Recommended Action Click the **Details** button to view the reason why the deletion failed. For more information, contact Cisco technical support.

Error Message `EID-1061: Error creating ring provisioner: Could get data for the selected ring.`

Recommended Action Mark the NEs in the ring as out of service (OOS) and in service (IS).

Error Message `EID-1062: Error occurred while retrieving protect port details.`

Recommended Action Click the **Details** button to view the reason for failure. For more information, contact Cisco technical support.

Error Message `EID-1063: Cannot have a four-fiber ring on` *`location`*`.`

Recommended Action The current topology does not support 4-fiber rings. Click **Details** button to view reasons why the 4-fiber ring is not supported. Contact your system administrator.

Error Message `EID-1701: Cannot allocate memory for:` *`value`*`.`

Recommended Action The MGMServer.cfg file has been corrupted. Reinstall the Cisco MGM server.

Error Message `EID-1704: Error connecting to the database.`

Recommended Action The MGMServer.cfg file has been corrupted. Reinstall the Cisco MGM server.

Error Message `EID-2002: Bad category` *`value`* `in JMOCO event.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2003: JMOCO event is null.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2025: Cannot initialize the NE Service. Trying to stop the service.`

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with the output from the getinfo script.

Error Message EID-2026: Exception *string* occurred while initializing the NE Service. Trying to stop the service.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with the output from the getinfo script.

Error Message EID-3101: init: Exception *value* occurred while initializing trap service. The snmpTrapDispatcher or snmpTrapHandler could not be started.

Recommended Action The SNMP Trap Service could not start worker threads. Restart the Cisco MGM server.

Error Message EID-3105: createSnmpTrapHandler: Snmp Exception

Recommended Action This message might indicate a conflict in binding to the trap listener port. Remove any other UNIX process that is using this port.

Error Message EID-3106: createSnmpTrapHandler: Exception *string*.

Recommended Action Report the exception string to Cisco technical support.

Error Message EID-3107: createSnmpTrapHandler: run Exception *string*.

Recommended Action Report the exception string to Cisco technical support.

Error Message EID-3110: Exception: *string* occurred while creating Snmp trap queue.

Recommended Action This is a fatal error with the Cisco MGM initialization. Restart the Cisco MGM server.

Error Message EID-3111: Main exception: *string* occurred while creating Snmp Trap Service.

Recommended Action This is a fatal error with the Cisco MGM initialization. Restart the Cisco MGM server.

Error Message EID-4235: Exception: No node exists with NEDB ID *string*.

Recommended Action Contact Cisco technical support.

Error Message EID-4237: Exception: Network Manager creating links from DB rows generated an exception.

Recommended Action Contact Cisco technical support.

Error Message `EID-6050: Exception. This method is not implemented for this network element.`

Recommended Action Contact Cisco technical support.

Error Message `EID-6051: Exception occurred while retrieving NE information.`

Recommended Action Contact Cisco technical support.

B.2.2 Major Server Error Messages

Error Message `EID-202: Error destroying thread.`

Recommended Action The MGMServer.cfg file has been corrupted. Reinstall the Cisco MGM server.

Error Message `EID-203: Invalid thread ID.`

Recommended Action If the Cisco MGM server starts, ignore this internal error. If the server does not start, increase the memory or swap space on the server workstation. If the problem persists, contact Cisco technical support.

Error Message `EID-204: Error creating work queue.`

Recommended Action If the Cisco MGM server starts, ignore this internal error. If the server does not start, increase the memory or swap space on the server workstation. If the problem persists, contact Cisco technical support.

Error Message `EID-206: Error scheduling work.`

Recommended Action If the Cisco MGM server starts, ignore this internal error. If the server does not start, increase the memory or swap space on the server workstation. If the problem persists, contact Cisco technical support.

Error Message `EID-208: Work queue/work was destroyed.`

Recommended Action If the Cisco MGM server starts, ignore this internal error. If the server does not start, increase the memory or swap space on the server workstation. If the problem persists, contact Cisco technical support.

Error Message `EID-209: Worker thread is exiting.`

Recommended Action If you receive this error during normal operation, restart the server. This error is normal during shutdown.

Error Message `EID-212: Error waiting on a semaphore.`

Recommended Action If the Cisco MGM server starts, ignore this internal error. If the server does not start, increase the memory or swap space on the server workstation.

Error Message `EID-218: Memory corruption: bad header.`

Recommended Action Restart the Cisco MGM server.

Error Message `EID-219: Memory corruption: bad footer.`

Recommended Action Restart the Cisco MGM server.

Error Message `EID-226: Error creating socket.`

Recommended Action If the Cisco MGM server starts, ignore this internal socket-related error. If the server does not start, check the /etc/system file on the server workstation for the following lines:

```
set rlim_fd_max=XXX
set rlim_fd_cur=YYY
```

The value of *XXX* should be greater than or equal to 4096. The value of *YYY* should be greater than or equal to 2048. The value of rlim_fd_max should be greater than the value of rlim_fd_cur. Adjust the values; then, restart the server workstation.

Error Message `EID-227: Error in socket bind.`

Recommended Action If the Cisco MGM server starts, ignore this internal socket-related error. If the server does not start, check the /etc/system file on the server workstation for the following lines:

```
set rlim_fd_max=XXX
set rlim_fd_cur=YYY
```

The value of *XXX* should be greater than or equal to 4096. The value of *YYY* should be greater than or equal to 2048. Adjust the value; then, restart the server workstation.

Error Message `EID-228: Error in socket listen.`

Recommended Action This is an internal error. If the Cisco MGM server is not operating normally, restart the server.

Error Message `EID-229: Invalid socket.`

Recommended Action This is an internal error; no action is required.

Error Message `EID-232: Error establishing connection.`

Recommended Action The MGMServer.cfg file has been corrupted. Reinstall the Cisco MGM server.

Error Message `EID-237: Timer thread exiting.`

Recommended Action If the timer thread exits, the software and configuration upload/download will not work properly. Restart the server.

Error Message `EID-238: Unable to schedule timer work.`

Recommended Action This is an internal error; no action is required.

Error Message `EID-313: Length of request is more than expected.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-314: Cisco MGM server port not specified in configuration file.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-321: Unable to set up database entry for NE #`*`NE_ID`*`.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-325: Error encoding arguments.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-326: Error disabling the user login for` *`username`*`.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-327: Maximum number of client connections exceeded for` *`IP_address`*`:`*`socket_number`*`.`

Recommended Action This is an internal protocol error. The Cisco MGM client will display the appropriate message.

Error Message `EID-425: The EMS server may require a restart.`

Recommended Action Restart the Cisco MGM server. If the error persists, capture a LAN trace from the Cisco MGM server to help debug the problem.

Error Message `EID-606: Active alarm recovery looping for NE ID.`

Recommended Action The Cisco MGM server cannot recover the active or standing alarms on the NE because of a loop in the SNMP agent on the NE. Restart the NE.

Error Message `EID-801: Failed to connect to a socket.`

Recommended Action The MGMServer.cfg file has been corrupted. Reinstall the Cisco MGM server.

Error Message `EID-803: Invalid write errno = error_number_from_file /usr/include/sys/errno.h, size_to_write = size, wrote number bytes.`

Recommended Action This is an internal socket error. Data to the OSS overflowed, but the error will be corrected automatically.

Error Message `EID-803: Error while getting card list from server.`

Recommended Action This error is shown because the selected NEs do not have ML-series cards available for topology creation or because the ML-series cards are out of service. Check whether the ML-series cards in the selected NEs are active or not.

Error Message `EID-804: Invalid read errno = error_number_from_file /usr/include/sys/errno.h, size_to_read = size.`

Recommended Action This is an internal socket error. Check network connectivity.

Error Message `EID-808: Selected NEs/Group NEs are in different network partition.`

Recommended Action You are not allowed to create an L2 topology with NEs in different network partitions. Move the NEs to the same network partition.

Error Message `EID-809: Circuit creation failed between endpoints.`

Recommended Action Create circuits using Cisco MGM Circuit Creation wizard.

Error Message `EID-810: RPR got created partially because creation of some member circuit failed.`

Recommended Action Create the member circuits using the L2 topology point-to-point Circuit Creation wizard.

Error Message `EID-818: Please select a topology to view the circuits in the topology.`

Recommended Action Select a different topology.

Error Message `EID-819: Selected topology is undergoing Resync. Please wait until the L2 Topology Resync is completed.`

Recommended Action Wait until the topology resynchronization is completed.

Error Message `EID-820: Some of the selected L2 topologies is undergoing Resync. Please wait until the L2 Topology Resync is completed. Please click details to see the list of L2 topologies undergoing resync.`

Recommended Action Wait until all the selected topologies complete the resynchronization or select the topologies that have completed resynchronization and then perform the operation.

Error Message `EID-821: Select a row and then click on Create L2 service button.`

Recommended Action Select a row in the topology table before clicking on the Create L2 Service button.

Error Message `EID-822: Selected topology is undergoing Resync. Please wait until the L2 Topology Resync is completed.`

Recommended Action Wait until the topology resynchronization is completed.

Error Message `EID-823: Access Violation. Check if you have user privileges to perform this operation on this L2 topology.`

Recommended Action Verify that you have the privileges to perform the operation.

Error Message `EID-824: NEs in the topology are not in User domain.`

Recommended Action Verify that the source NE is in the user domain.

Error Message `EID-825: Failed to update the description of the topology.`

Recommended Action Close the Modify L2 Topology window and try again. If the problem persists, contact Cisco technical support.

Error Message `EID-826: No ports available for modification.`

Recommended Action Close the Modify Ports window and try again. If the problem persists, contact Cisco technical support.

Error Message `EID-827: Failed to modify ports.`

Recommended Action Close the Modify Ports window and wait until topology resynchronization is complete before trying again. If the problem persists, contact Cisco technical support.

Error Message `EID-828: There are no M-cards in the topology.`

Recommended Action Check whether all the ML-series cards are present and try again. If the problem persists, contact Cisco technical support.

Error Message `EID-902: Cannot allocate memory.`

Recommended Action Increase the available memory or swap space on the server workstation and restart the application.

Error Message `EID-903: Cannot find table element.`

Recommended Action This is an internal CLI parser error; no action is required.

Error Message `EID-904: Entry already present in the table.`

Recommended Action This is an internal CLI parser error; no action is required.

Error Message `EID-905: Invalid type in cfg_find_or_add.`

Recommended Action This is an internal CLI parser error; no action is required.

Error Message `EID-1101: Database_error_string.`

Recommended Action The database error string describes the error in detail. If the Cisco MGM server fails to come up, check the Oracle username and password. For more information, refer to the Oracle's documentation.

Error Message `EID-1301: Error_string.`

Recommended Action This is a generic internal error used for debugging purposes.

Error Message `EID-1302: System error: error_string.`

Recommended Action This is a generic internal error used for debugging purposes.

Error Message `EID-1401: The OSI daemon osiamxd is not present.`

Recommended Action The MGMServer.cfg file has been corrupted. The Open System Interconnection (OSI) daemon osiamxd is missing. Reinstall the Cisco MGM server.

Error Message `EID-2008: Exception string occurred while notifying main.`

Recommended Action The internal TCP/IP communication channel has gone down. The Cisco MGM server will restart the service automatically.

Error Message EID-2014: Exception: *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2015: Null NetElement for NE: *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2016: Null NodeModel for NE: *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2017: Exception: *string* for NE *ID* while *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2018: Null pointer: *exception_string* for NE: *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2019: Operation failed: *exception_string* for NE: *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2021: Inventory collection was not completed for NE: *NE_ID.*

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2028: NetCircuitWatchDog is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2029: TopologyClientImpl is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2030: EventDispatcher received is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2031: CerentCMService is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2032: Exception *string* occurred while reading NE *NE_ID* from the NE_Info_Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2033: Exception *string* occurred while reading GNE *GNE_ID* from the GNE_Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2034: Cannot find matching GNE in the GNE_Table. The database might be inconsistent.

Recommended Action Check the GNE information; then, restart the Cisco MGM server.

Error Message EID-2041: Network is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2042: Circuit main thread has been interrupted.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2043: *Exception_string* occurred while initializing the circuit database tables.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2044: *Exception_string* occurred while deleting from Circuit Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2045: *Exception_string* occurred while deleting from Circuit Destination Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2046: *Exception_string* occurred while deleting from Circuit Span Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2048: *Exception_string* occurred while adding to Circuit Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2049: *Exception_string* occurred while adding to Circuit Destination Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2050: *Exception_string* occurred while adding to Circuit Span Table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2056: *Exception_string* occurred while sending circuit update event.

Recommended Action The internal TCP/IP communication channel has gone down. Restart the Cisco MGM server.

Error Message EID-2057: Cannot instantiate Circuit Manager. Network instance is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2059: Cannot add discovered NE. Hostelem is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2060: Cannot add discovered NE. Error occurred while converting the IP address to a long value.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2061: Cannot add discovered node. NE information for GNE is null.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2062: *Exception_string* occurred while adding discovered NE.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2063: Null database row returned while adding a discovered NE.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2064: Null NE ID returned while adding a discovered NE.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2065: *Exception_string* occurred while getting tree node string for parent.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2066: Exception *string* occurred while adding discovered NE to the area tree table.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2067: Error occurred while adding discovered NE to the database.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2068: Exception *string* occurred while initializing discovered NE.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2069: Exception *string* occurred while updating NE IP address.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2070: Exception *string* occurred while initializing discovered NE that exists in the database.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2074: Invalid instance in topology update.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2077: Cannot add discovered NE to the database. JMOCO session is null.

Recommended Action The internal TCP/IP communication channel has gone down. The Cisco MGM server will restart the service automatically.

Error Message EID-2081: Exception: *string* occurred while retrieving network links from the database.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2082: Exception: string occurred while reading snmp-trap-queue-size parameter value from the MGMServer.cfg file.

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2083: Exception: *value* occurred while reading snmp-trap-drop-size parameter value from the MGMServer.cfg file.

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2084: Exception: *string* occurred while reading snmp-trap-forwarding-port parameter value from the MGMServer.cfg file.

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2086: Exception: *value* occurred while reading the ons15454-callback-iiop-listen-port parameter value from the MGMServer.cfg file.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2104: Exception *string* occurred while adding discovered NE with IP address *IP_address*.

Recommended Action Exception needs to be analyzed. Contact Cisco technical support.

Error Message EID-2105: Adding operation for discovered NE with IP address *IP_address* not completed.

Recommended Action Exception needs to be analyzed. Contact Cisco technical support.

Error Message EID-2200: Software download operation failed on NE ID.

Recommended Action Retry the download operation. The cause of the software download operation failure is unknown.

Error Message EID-2202: Software download operation failed on NE ID because of a Flash read/write problem.

Recommended Action The agent version transfer from the master Control and Monitoring Processor (CMP) to the slave CMP has failed. Use the following procedure to correct the error:

Step 1 Check the configuration of the master and slave CMPs.

Step 2 Check the status of the network between the master CMP and the slave CMP and verify that the CMP slaves are reachable.

Error Message EID-2203: Software download operation failed on NE ID because of a problem during transfer from the TFTP server to the Master CMP.

Recommended Action Transfer from the TFTP boot server to the master CMP has failed. Use the following procedure to correct the error:

Step 1 Verify that the TFTP boot server is running.

Step 2 Verify that the TFTP server address is correct.

Step 3 Check the status of the network between the TFTP server and the master CMP.

Step 4 Verify that the path name that lists where the catalog.txt file is located is correct.

Step 5 Verify that all files listed in the catalog.txt file are present in the same directory that contains the catalog.txt file.

Error Message `EID-2204: Software download operation failed on NE ID because the standby agent version is running.`

Recommended Action The standby agent version is running. A download operation is allowed only when the active agent version is running. There are two options to correct the error:

- Reset the NE to run the active agent version; then, overwrite the standby agent version by using the download operation.
- Swap the active and standby agent versions through the commit operation; then, overwrite the new standby agent version by using the download operation.

Error Message `EID-2205: Software revert operation failed on NE ID.`

Recommended Action The cause of the software revert operation failure is unknown. Retry the revert operation.

Error Message `EID-2207: Software revert operation failed on NE ID because the standby agent version is corrupted.`

Recommended Action The standby agent version is corrupted. Use the following procedure to correct the error:

Step 1 Execute a new download operation to replace the current standby agent version with the valid one.

Step 2 Execute the revert operation again; then, verify that the new downloaded version works correctly.

Error Message `EID-2208: Software commit operation failed on NE ID.`

Recommended Action The software commit operation failure cause is unknown. Retry the commit operation.

Error Message `EID-2210: Software commit operation failed on NE ID because the standby agent version is corrupted.`

Recommended Action The standby agent version is corrupted. Use the following procedure to correct the error:

Step 1 Execute a new download operation to replace the current standby agent version with the valid one.

Step 2 Execute a revert operation and verify that the new downloaded version works correctly.

Step 3 Execute the commit operation again.

Error Message `EID-2211: Exception during NE ID reset.`

Recommended Action Reset the NE again.

Error Message `EID-2212: Software download operation failed because of invalid path parameter.`

Recommended Action Verify that the path name (representing the path on the TFTP server where the catalog.txt file is located) has the correct format.

Error Message `EID-2214: NE User Management failed - Selected user doesn't exist on NE ID.`

Recommended Action None.

Error Message `EID-2217: NE User Management failed - Duplicated username for NE ID.`

Recommended Action Retry the operation and verify that the username is not already present in the NE User Access Administration table.

Error Message `EID-2218: NE User Management failed - Super user cannot be modified or deleted on NE ID.`

Recommended Action You tried to delete or modify a SuperUser that had an active connection open. Use the following procedure to correct the error:

Step 1 Open the NE Active Users Table and disconnect the SuperUser connection.

Step 2 Retry the operation.

Note You cannot delete a SuperUser.

Error Message `EID-2219: Performance Monitoring Task (date and time) not completed because of Agent busy on NE ID.`

Recommended Action This error occurs when the agent on the NE is busy. Make sure that the agent on the NE is not overloaded.

Error Message `EID-2221: Performance Monitoring task failed to connect to NE ID.`

Recommended Action Make sure that the log in information is correct. If the problem persists, contact Cisco technical support.

Error Message `EID-3015: Cannot start collector.`

Recommended Action Open the Control Panel. Expand **MGM** and **PM Service**. Stop and restart the PM service. If the problem persists, contact the Cisco MGM administrator.

Error Message `EID-3016: Cannot register for events.`

Recommended Action Open the Control Panel. Expand **MGM** and **PM Service**. Stop and restart the PM service. If the problem persists, contact the Cisco MGM administrator.

Error Message `EID-3017: Cannot open tables.`

Recommended Action Open the Control Panel. Expand **MGM** and **PM Service**. Stop and restart the PM service. If the problem persists, contact the Cisco MGM administrator.

Error Message `EID-3019: Cannot retrieve information for new NE` *`value`*`.`

Recommended Action Delete the NE from Cisco MGM. Add the NE again; then, enable PM after the NE is reachable. If the problem persists, contact the Cisco MGM administrator.

Error Message `EID-3021: Cannot collect PM information from` *`value`*`. Value Retries failed (HTTP error:` *`string`*`).`

Recommended Action Wait for the next PM cycle. If the problem persists, open the MGMServer.cfg file and change the pm-wait-period value from 10000 to 30000. If the problem still persists, contact the Cisco MGM administrator.

Error Message `EID-3022: Cannot collect PM information from` *`string`*`. Data format error. Received Data=` *`string`*`.`

Recommended Action Contact the Cisco MGM administrator.

Error Message `EID-3024: Error in parsing ETM XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3025: Error in parsing ETM XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3028: Error in parsing time XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3030: Error in getting tick rate. XML received is null.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3031: Error in parsing tick rate XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3033: Error in getting time zone. XML received is null.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3034: Error in parsing time zone XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3036: Error in getting date. XML received is null.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3037: Error in parsing date XML.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3104: Exception: value occurred while reading ne-service-thread-pool-size parameter value from the MGMServer.cfg file.`

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-3108: Exception: value occurred while reading snmp-trap-port parameter value from the MGMServer.cfg file.`

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-3109: Exception: value occurred while reading snmp-trap-queue-size parameter value from the MGMServer.cfg file.`

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message. Or, reinstall the Cisco MGM server.

Error Message EID-4001: Exception: *string* occurred while connecting the CORBA object to the Object Request Broker (ORB).

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4002: *Exception*: *string* occurred while creating the ConfigManager Interoperable Object Reference (IOR).

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4003: Error in creating the ConfigManager IOR file.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4004: Exception: *string* occurred while writing the IOR to the file.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4005: Exception: *string* occurred while waiting for a CORBA client connection.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4006: Error in creating the SessionManager.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4007: Exception: *string* occurred while creating the NodeManager for *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4008: Exception: *string* occurred while connecting the NodeManager for *NE_ID* to ORB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4018: Exception: *string* while registering for the internal Cisco MGM events with the main server.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4020: Exception: *string* while configuring the Internet Inter Orb Protocol (iiop) listen port in CORBA ORB.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4023: Exception: *string* while reading the list of logged users using JMOCO.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4026: Exception: *string* while disconnecting the NodeManager for *NE_ID* to ORB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4027: Exception: *string* ConfigManager Init. Failed.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4233: Failed to get available termination points.

Recommended Action Retry after some time. If the problem persists, contact Cisco technical support.

Error Message EID-4239: Exception: NetworkManager.setPathTrace APIs raised exception.

Recommended Action Retry after some time. If the problem persists, contact Cisco technical support.

Error Message EID-4241: Exception: NetworkManager.getPathTrace APIs raised exception.

Recommended Action Retry after some time. If the problem persists, contact Cisco technical support.

Error Message EID-4242: Exception: deletelink () unable to delete manual link. Link ID is *string*.

Recommended Action Review the reason for failure stated in the error message. Retry after some time. If the problem persists, contact Cisco technical support.

Error Message EID-5000: Exception: *string* occurred while initializing ServiceManager.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5001: Exception: *string* occurred while connecting the CORBA object to the ORB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5002: Exception: *string* occurred while creating the ServiceManager IOR.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5003: Error in creating the ServiceManager IOR file.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5006: Exception: *string* occurred while initializing CORBA.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5007: Exception: *string* occurred while getting POA reference.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5013: Exception: *string* occurred while notifying main.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-5031: Exception: string occurred while launching service process.`

Recommended Action Verify that the server has adequate RAM and swap space as listed in the *Cisco Media Gateway Manager 5.0 Installation Guide*. Do not run other unapproved software on the server.

Error Message `EID-5041: Exception: string occurred while trying to connect to Service Manager.`

Recommended Action Run the **showmgm** command to see what Cisco MGM server processes are running. Restart the Cisco MGM server using the **mgms-start** command.

Error Message `EID-5042: Exception: string occurred while trying to disconnect from Service Manager.`

Recommended Action Run the **showmgm** command to see what Cisco MGM server processes are running. Restart the Cisco MGM server using the **mgms-start** command.

Error Message `EID-6055: ML series card provisioning operation failed for NE: string - slot: NE_ID Reason: string.`

Recommended Action Check the ML card setting (telnet information) and if problem persists, contact Cisco technical support.

Error Message `EID-7002: Cannot retrieve wavelength values.`

Recommended Action Force a “Refresh from NE” operation on both ends of the link.

B.2.3 Minor Server Error Messages

Error Message `EID-408: Poller low on worker threads or poll frequency too fast.`

Recommended Action The application cannot communicate with all configured NEs during the allotted poll-frequency time. Use the following procedure to correct the error:

Step 1 Log into the Cisco MGM client with the appropriate user profile.

Step 2 Choose **Administration > Control Panel**.

Step 3 Click **NE Service**. In the NE Poller tab, decrease the poll frequency in the NE Health Poll Frequency field in 30-second increments.

Step 4 Click **Save**.

Error Message `EID-411: Invalid return of UDP sockets.`

Recommended Action This is an internal error; no action is required.

Error Message `EID-412: No free UDP sockets in pool.`

Recommended Action This is an internal error. Restart Cisco MGM if the application is not communicating with any NEs.

Error Message `EID-413: Invalid SNMP type in packet.`

Recommended Action This is an internal error. Restart Cisco MGM if the application is not communicating with any NEs.

Error Message `EID-414: Failed to open SNMP session.`

Recommended Action This is an internal error. Restart Cisco MGM if the application is not communicating with any NEs.

Error Message `EID-416: Error in SNMP packet: error_string.`

Recommended Action This is an internal SNMP protocol error; no action is required.

Error Message `EID-417: Mangled SNMP response packet.`

Recommended Action This is an internal SNMP protocol error; no action is required.

Error Message `EID-423: The EMS failed to recover missed alarms from NE ID.`

Recommended Action Cisco MGM could not recover all alarms from the NE. Data might be missing from the Alarm Log due to connectivity problems or mangled packets. In the Domain Explorer window, choose **Fault** > **Alarm Browser** to view the current alarms.

Error Message `EID-501: Incorrect parse of PM bulk string header for PM_data_type from NE ID.`

Recommended Action This is an internal parsing error. If the error persists, capture a LAN trace from the Cisco MGM server to help debug the problem.

Error Message `EID-502: Unknown type number in PM bulk variable for PM_data_type from NE ID.`

Recommended Action This is an internal parsing error. If the error persists, capture a LAN trace from the Cisco MGM server to help debug the problem.

Error Message `EID-503: Incorrect parse of PM bulk string for PM_data_type from NE ID.`

Recommended Action This is an internal parsing error. If the error persists, capture a LAN trace from the Cisco MGM server to help debug the problem.

Error Message `EID-603: Incorrect trap recvfrom with errno = value.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-604: Failed to parse SNMP trap definition file filename.`

Recommended Action The traps.lst file in the bin directory where the Cisco MGM server was installed is corrupted. Delete the traps.lst file and restart the application.

Error Message `EID-605: Failed to recover alarm sequence #number to #number for NE ID.`

Recommended Action Cisco MGM could not recover all alarms from the NE. There might be events missing in the Alarm Log due to connectivity problems or mangled packets. However, the Alarm Browser will reflect the correct alarm information. In the Domain Explorer window, choose **Fault** > **Alarm Browser** to view the current alarms.

Error Message `EID-704: Invalid SNMP recvfrom with errno = value.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-705: Invalid SNMP sendto with errno = value.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-706: SNMP trap received from unknown NE ID.`

Recommended Action SNMP traps are being received from an NE that is not configured on the Cisco MGM server. Check the configured IP addresses for all NEs by viewing the configuration files (startup-config). The IP addresses should match the IP address of the interface used in the "snmp-server trap-source *IF*" CLI in the NE configuration.

Error Message `EID-1402: The OSI daemon lockfile value is missing.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-1403: The OSI daemon lockfile does not contain the PID.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-1404: The ping to the OSI daemon failed.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-1405: Failed to start the OPS daemon for logging.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-1501: Maximum number of Telnet sessions has been reached.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-1502: No more threads available for Telnet sessions.`

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-2001: Bad event JMOCO PDU` *`value`*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2004: Exception` *`string`* `occurred while notifying listeners.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2005: Bad severity` *`value`* `in JMOCO event.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2006: Event is not an instance of known VWEvents.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-2007: Event is not an instance of EMSEvent.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2009: Null object is passed in.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2010: Invalid object type is passed in.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2011: Null module type for slot *number*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2012: JDAQ external exception: *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2013: JDAQ internal exception: *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2020: Invalid argument value: *string*, NE: *NE_ID*.

Recommended Action This is an internal processing error. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2021: Inventory collection was not completed for NE *NE_ID*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2022: Exception *string* occurred while reading the corba-request-timeout parameter value from the MGMServer.cfg file.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2023: Exception *string* occurred while setting the corba-request-timeout parameter value for the ORB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2024: Exception *string* occurred while reading the ne-service-thread-pool-size parameter value from the MGMServer.cfg file.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2029: Exception: *string* for NE: *exception_string* while *exception_string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2035: GNE next hop IP address *value* does not match the NE IP address *value* for NEDBAccessID *value*. The GNE_Table or NE_INFO_Table information might be inconsistent in the database.

Recommended Action Check the GNE next hop IP addresses; then, restart the Cisco MGM server.

Error Message EID-2036: Exception *string* for NE *ID* occurred while polling for the discovered node.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2037: Unsupported model type or null version string for *NE_ID*.

Recommended Action Check the software version of the NE listed in the error message. You might need to upgrade Cisco MGM.

Error Message EID-2038: No entry found in the version table for *NE_ID*.

Recommended Action Check the software version of the NE listed in the error message. You might need to upgrade Cisco MGM.

Error Message EID-2039: Exception *string* occurred while finding time offset for *NE_ID*.

Recommended Action Check the software version of the NE listed in the error message. You might need to upgrade Cisco MGM.

Error Message EID-2040: Cannot find time or time zone information for *NE_ID*.

Recommended Action Check the system time and time zone settings. You might have to adjust the settings.

Error Message EID-2052: Invalid object passed to Circuit Module work.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2053: Exception *string* occurred while adding circuit.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2054: Exception *string* occurred while deleting circuit.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2055: Exception *string* occurred while updating circuit.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2071: Exception *string* occurred while invoking addNetLink.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2072: CORBA exception *string* occurred while retrieving topology information.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2073: Exception *string* occurred while retrieving topology information.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2075: Exception *string* occurred while retrieving NE information.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2076: Null NE information.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-2082: Exception: *value* occurred while reading snmp-trap-queue-size parameter value from the MGMServer.cfg file.

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2084: Exception: *value* occurred while reading snmp-trap-forwarding-port parameter value from the MGMServer.cfg file.

Recommended Action Check the MGMServer.cfg file for possible corruption. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-2089: InitialPoll to NE: *string* is failed, maybe username and password are wrong or *string*.

Recommended Action Verify that the NE is up and that the software loaded on the NE is supported. Wait for two or three polling cycles. If the problem persists, mark the NE as out of service and then back in service.

Error Message EID-2090: Connection with NE: *string* is lost because *string*.

Recommended Action This problem can occur if the NE is reset or if the NE is not reachable on the network. Wait for two or three polling cycles. If the problem persists, mark the NE as out of service and then back in service.

Error Message EID-2091: HTTP request failed to get software version from node *string* and reason is *string*.

Recommended Action Obtain the NE software version with a web browser using the URL http://*IP_address_of_NE*/getSwVersion. If the connection times out, the web server on the NE might be down. Contact technical support for the NE.

Error Message EID-3001: Cannot start collection for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3002: Nothing was found *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3003: Ignoring TCA.

Recommended Action A threshold crossing alert (TCA) is being ignored. If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3004: Incorrect IP address passed in IPADDR_CHANGED Event *value*.

Recommended Action Check the newly changed IP address and modify it if you entered the wrong information.

Error Message EID-3005: Cannot write DS-1 PM for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3006: Cannot write DS-3 PM for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3007: Cannot write SONET PM for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3008: Cannot write STS PM for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3009: Cannot write VT PM for *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3010: Cannot collect PM information from *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3011: Cannot read PM information from *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-3013: Cannot collect PM information from *value*. HTTP Error: *value*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3014: Cannot collect PM. Writer creation failed.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-3047: PM Comm Session is null for` *`NE_name`*`.`

Recommended Action Verify that the NE has available connections.

Error Message `EID-3049: Exception during PM collection for` *`NE_name`*`:` *`exception_string`*`.`

Recommended Action Verify that the NE has available connections.

Error Message `EID-3050: Cannot write PM data for` *`NE_name`*`:` *`exception_string`*`.`

Recommended Action Verify that the database is operating correctly.

Error Message `EID-3100: args == null.`

Recommended Action This message is used for system logging only; no action is required.

Error Message `EID-3102: Initialized service:`

Recommended Action This message is used for system logging only and is normal at initialization; no action is required.

Error Message `EID-3103: Stopped service.`

Recommended Action This message is for system logging only and is normal when the system is stopped; no action is required.

Error Message `EID-4009: NEInfo is null.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4010: Invalid input parameter for the operation.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4011: The Configuration resync operation cannot be completed because of the non-working operational state of the network element.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4012: The Configuration resync is already in progress for this network element. Try after some time.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4013: Failed to authenticate the Cisco MGM user for performing this operation.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4014: This Interface Data Language (IDL) operation is not supported by the network element.

Recommended Action Ignore this internal error message.

Error Message EID-4015: Exception: *string* while reading configuration resync frequency from the MGMServer.cfg file. Using the default resync frequency.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4016: Exception: *string* while reading configuration poll frequency from the MGMServer.cfg file. Using the default poll frequency.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4017: Exception: *string* while reading configuration thread pool size from the MGMServer.cfg file. Using the default poll frequency.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message EID-4019: Exception: *string* while reading the iiop-listen-port from the MGMServer.cfg file. Using the default port.

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-4021: Exception: string while reading configuration request queue size from the MGMServer.cfg file. Using the default request queue size.`

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-4022: Cisco MGM server is busy syncing the configuration information for this network element. Retry after some time.`

Recommended Action This error message is used for internal protocols between the Cisco MGM client and server. The client will display the appropriate error message.

Error Message `EID-4024: Exception: string received from the model layer.`

Recommended Action This error message is used for internal protocols between the Cisco MGM client and server. The client will display the appropriate error message.

Error Message `EID-4025: Exception: string while sending event about this change to other clients.`

Recommended Action Restart the Cisco MGM server. If the problem persists, contact Cisco technical support with this error message.

Error Message `EID-4201: Failed to auto back up memory for NE_name: Value.`

Recommended Action Manually back up the configuration.

Error Message `EID-4202: Failed to back up memory for NE_name: Value.`

Recommended Action Retry this operation later. If the problem persists, reboot the NE and retry.

Error Message `EID-4203: Failed to restore memory for NE_name: Value.`

Recommended Action If you specify a source directory that is the same as the default destination for memory restore or software download, you will receive EID-4203 because the source file size becomes zero.

To retrieve the file, navigate to the appropriate path and restore the file *x* from *x*.old.

Error Message `EID-4204: Failed to download software for NE_name: Value.`

Recommended Action If you specify a source directory that is the same as the default destination for memory restore or software download, you will receive EID-4204 because the source file size becomes zero.

To retrieve the file, navigate to the appropriate path and restore the file *x* from *x*.old.

Error Message `EID-4205: Failed to {activate | revert} for NE_name: Detailed_error_message.`

Recommended Action Follow the instructions given in the detailed error message.

Error Message `EID-4206: Exception: The node is not managed by the NEService.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4207: Exception: The node is not available.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4208: Exception: Chassis is null for the node.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4209: Exception: No terminations available for the given link size.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4210: Exception: NetworkManager raises exception.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4211: Exception: NetworkManager fails to modify Database Link Table.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4212: Exception: CreateLinkWithName called with null name.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4213: Exception: Failed to add link in database.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4214: Exception: Failed to get link in database.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4215: Exception: Failed to modify link in database.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4216: Exception: No link exists with Link ID` *`string`*`.`

Recommended Action The links have not yet uploaded to the database. Wait several minutes; then, try again. If the problem persists, check the link connectivity.

Error Message `EID-4217: Exception: Failed to get info. for link ID` *`string`* `from NCP.`

Recommended Action The links have not yet uploaded to the network. Wait several minutes; then, try again. If the problem persists, check the link connectivity.

Error Message `EID-4218: Exception: Accessing/Updating Database during processing of Auto. Discovered links failed.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4219: Exception: NetworkManager.getExpectedPathTrace raised exception.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4220: Exception: NetworkManager.getPossibleLinkSizes raises exception.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4223: Exception: Failed to get info. for link ID` *`string`* `from Database.`

Recommended Action The links have not yet uploaded to the database. Wait several minutes; then, try again. If the problem persists, check the link connectivity.

Error Message EID-4224: Exception: deleteLink() Cannot Delete an Auto. Discovered Link. Link ID is *string*.

Explanation If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4225: Exception: getNetLinks() DBException Raised while getting Network Links from DB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4226: Exception: getNetLinksForNode() DBException Raised while getting Network Links from DB for Node Id.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4227: Exception: getDbLinksBetweenSrcAndDest() DBException Raised while getting Network Links from DB.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4228: Exception: deleteLink() DBException raised while executing deleteRow() for Link ID *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4229: Exception: deleteLink() Invalid Link ID *string*.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-4236: Exception: NetworkManager.getPathTrace APIs raised exception. J1 Path Trace is not supported for this card.

Recommended Action No action is required.

Error Message EID-4238: Exception: NetworkManager.getPathTrace APIs raised exception. J1 Path Trace is supported only for XTC(DS1).

Recommended Action No action is required.

Error Message `EID-4500: Exception: Invalid model type for this operation.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4501: Exception: Backup/Restore internal exception.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-4502: Error: string cannot be cancelled since they are waiting in the running list to be executed.`

Recommended Action Wait until the job or task completes, or restart the Cisco MGM server.

Error Message `EID-4503: Error: Unable to read database table: string.`

Recommended Action Restart the Cisco MGM server and retry.

Error Message `EID-4504: Error: Unable to process NE purge event for NEDBID: string.`

Recommended Action No action is required.

Error Message `EID-5011: Cannot register to listen for events.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-5012: Exception: string while processing CORBA requests.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-5022: Exception: string occurred while trying to get managed NE list.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message `EID-5023: Exception: string occurred while trying to get service ID.`

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5024: Exception: *string* occurred while trying to purge NE.

Recommended Action If you are having operational problems, contact Cisco technical support with this error message. Otherwise, ignore this error message; no action is required.

Error Message EID-5025: The MGM Service is currently connected to Service Manager.

Recommended Action Wait until the AUD-5004 message is displayed; then, click the **Activate** button again.

Error Message EID-5026: The MGM Service is not connected to Service Manager.

Recommended Action Wait until the AUD-5003 message is displayed; then, click the **Deactivate** button again.

Error Message EID-5030: Exception: *string* occurred while performing DB operations.

Recommended Action Check the database (DB) configurations. Verify that you can connect to the database and perform a structured query language (SQL) query.

Error Message EID-6052: Exception: source and destination termination points are not valid. Cannot create Managed-Unmanaged link.

Recommended Action Review the reason for failure stated in the error message.

Error Message EID-6053: Link cannot be created due to presence of conflicting links.

Recommended Action Review the reason for failure stated in the error message.

Error Message EID-6054: Link not valid between the specified end points in the specified layer.

Recommended Action Review the reason for failure stated in the error message.

Error Message EID-7000: Source PTP is supporting wavelength *string* while sink PTP is supporting *NE_ID*: The wavelength don't match.

Recommended Action Select PTPs that support the same wavelength.

Error Message EID-7001: DWDM links can only be created between transponders/muxponders and DWDM cards.

Recommended Action Select PTPs such that an end of the link is on a transponder or muxponder and the other end is on a DWDM card.

B.2.4 Debug Server Error Messages

Error Message `EID-4028: String communication state: NE_ID; string = NESysID, NE_ID = NE connection state.`

Recommended Action Try and restore the connection to the NE.

Note Detailed actions are NE-dependent.

Error Message `EID-4029: String operational state: NE_ID; string = NESysID, NE_ID = NE operational state.`

Recommended Action Set the NE state to In Service.

Error Message `EID-4030: The NE resync operation cannot be completed because of the non-working operational state of the network element.`

Recommended Action NE is already in synchronization state. Retry after some time.

Error Message `EID-4031: The NE resync is already in progress for this network element. Try after some time.`

Recommended Action NE is already in synchronization state. Retry after some time.

Error Message `EID-4032: Invalid initial poll status.`

Recommended Action NE's initial poll is in progress. Retry after some time.

B.3 Cisco MGM Server Audit Messages

Cisco MGM server audit messages appear in the Audit Log and include the following information:

- Date and time
- Module
- Filename
- Line number
- Audit ID
- Audit message text

Note Server audit messages are informational only and do not require any action, unless noted.

`Audit Message  AUD-101: Cisco MGM user username logged in from location.`

Audit Message AUD-102: Cisco MGM user *username* logged out from *location*.

Audit Message AUD-105: Job# *number* succeeded for NE: *NE_name*.

Audit Message AUD-106: Job# *number* failed for NE: *NE_name* with the error: *error_message*.

Recommended Action The job can fail to start if the NE is unavailable or if the configured SNMP community string does not have write privileges. Verify that the NE is available and that the community string has write privileges.

Audit Message AUD-107: Failed to recover changed configuration from NE: *NE_name*. Error: *error_message*.

Recommended Action This error might occur if there are network problems or if the Flash device on the NE is busy. The Cisco MGM server automatically tries to recover the changed configuration information. No action is required.

Audit Message AUD-108: Job# *number* cancelled for NE: *NE_name*.

Audit Message AUD-109: Job# *number* started for NE: *NE_name*.

Audit Message AUD-110: Job# *number* failed to start for NE: *NE_name*.

Recommended Action The job can fail to start if the NE is unavailable or if the configured SNMP community string does not have write privileges. Verify that the NE is available and that the community string has write privileges.

Audit Message AUD-111: Failed to recover changed configuration from NE: *NE_name*.

Recommended Action This error might occur if there are network problems or if the Flash device on the NE is busy. The Cisco MGM server automatically tries to recover the changed configuration information. No action is required.

Audit Message AUD-112: Security violation for Cisco MGM user *username* from *IP_address*.

Audit Message AUD-113: Cisco MGM user *username_type_of_profile_change*.

Audit Message AUD-114: Topology changed: *type_of_topology_change_from_Domain_Explorer*.

Audit Message AUD-115: State for *NE_ID* changed from *state* to *state*.

Note *In Service*, *In Maintenance,* and *Out of Service* are examples of states.

Audit Message AUD-116: State for port *number* of *NE_ID* changed from *state* to *state*.

Audit Message AUD-117: GNE for *NE_ID* changed from *old_GNE_name* to *new_GNE_name*.

Audit Message AUD-118: Cisco MGM server started.

Audit Message AUD-119: Cisco MGM server stopped.

Audit Message AUD-120: The NE configured as *NE_ID* is actually *NE_ID*.

Audit Message AUD-121: Administrative task *number* deleted.

Audit Message AUD-122: The MGM service *service* has been stopped.

Audit Message AUD-123: The MGM service *service* has been started.

Audit Message AUD-124: MGM subnet *subnet*.

Audit Message AUD-125: Alarm acknowledged for NE: *NE_name*, index: *index*.

Audit Message AUD-126: Job# *number* is created for NE: *NE_name*.

Audit Message AUD-127: Time offset (*value* sec) is too big on NE: *NE_name*, will use MGMS time.

Audit Message AUD-128: Alarm acknowledged for NE *name* alarm ID *number*.

Audit Message AUD-129: Service *service_name* is started.

Audit Message AUD-130: Service *service_name* is shut down.

Audit Message AUD-130: Job cancelled.

Audit Message AUD-131: NE *name* moved to In Service from *present_state*.

Audit Message AUD-131: Task cancelled.

Audit Message AUD-132: NE *name* moved to Out of Service from *present_state*.

Audit Message AUD-132: Task modified.

Audit Message AUD-134: NE *name* moved to In Maintenance from *present_state*.

Audit Message AUD-135: NE *name* Port *port_number* state changed to In Service.

Audit Message AUD-136: NE *name* Port *port_number* state changed to Out of Service.

Audit Message AUD-138: NE *name* Port *port_number* state changed to In Maintenance.

Audit Message AUD-139: NE *name* property changed - New Sys ID *value*.

Audit Message AUD-140: NE *name* property changed - New IP address *value*.

Audit Message AUD-141: NE *name* property changed - New NSAP address *value*.

Audit Message AUD-142: NE *name* property changed - New description *value*.

Audit Message AUD-143: NE *name* property changed - New community string *value*.

Audit Message AUD-144: NE *name* property changed - New CLLI code *value*.

Audit Message AUD-145: NE *name* property changed - New NE type *value*.

Audit Message AUD-146: NE *name* property changed - New model index *value*.

Audit Message AUD-147: NE *name* property changed - New subnet ID *value*.

Audit Message AUD-148: NE *name* property changed - New system title *value*.

Audit Message AUD-150: NE *name* property changed - New user label *value*.

Audit Message AUD-151: NE *name* property changed - New vendor name *value*.

Audit Message AUD-152: NE *name* property changed - New version *value*.

Audit Message AUD-153: NE *name* property changed - New GNE *value*.

Audit Message AUD-154: NE *name* property changed - Config Mode *number*.

Audit Message AUD-155: NE *name* property changed - Family Seed Old *value* New *value*.

Audit Message AUD-156: NE *name* property changed - PM collection is *value*.

Audit Message AUD-157: Subnet *value* title changed.

Audit Message AUD-158: Subnet *value* type changed.

Audit Message AUD-159: Subnet *value* topology changed.

Audit Message AUD-160: Subnet *value* GNE changed.

Audit Message AUD-161: Subnet *value* name changed.

Audit Message AUD-162: Subnet *value* user label changed.

Audit Message AUD-163: Topology changed - Group *value* added.

Audit Message AUD-164: Topology changed - Group *value* deleted.

Audit Message AUD-165: Topology changed - NE *NE_ID* added.

Audit Message AUD-166: Topology changed - NE *NE_ID* deleted.

Audit Message AUD-167: Topology changed - GNE *NE_ID* added.

Audit Message AUD-168: Topology changed - GNE *NE_ID* deleted.

Audit Message AUD-171: Topology changed - Node *NE_ID* added.

Audit Message AUD-172: Topology changed - Node *NE_ID* deleted.

Audit Message AUD-173: Topology changed - Node *NE_ID* modified.

Audit Message AUD-174: MGM user *username* logged in.

Audit Message AUD-175: MGM user *username* logged out.

Audit Message AUD-176: MGM user *username* security violations.

Audit Message AUD-177: MGM user *username* profile changed - User added.

Audit Message AUD-178: MGM user *username* profile changed - User deleted.

Audit Message AUD-179: MGM user *username* profile changed - User modified.

Audit Message AUD-180: MGM user *username* profile changed - Domain name changed.

Audit Message AUD-181: MGM user *username* profile changed - Node assignment changed.

Audit Message AUD-182: MGM user *username* profile changed - Domain description changed.

Audit Message AUD-184: Failed login threshold exceeded for user *username*.

Audit Message AUD-185: Password aged out for user *username*.

Audit Message AUD-186: MediaGatewayManager user *username* forced to log out from *IP_address*.

Audit Message AUD-187: MediaGatewayManager service *service_name* logged in from *username*.

Audit Message AUD-188: MediaGatewayManager service *service_name* logged out from *username*.

Audit Message AUD-189: MediaGatewayManager service *service_name* logged out unexpectedly from *username*.

Recommended Action Check the Service Monitor to see whether the server automatically started a new instance of this service. If a new instance does not start within five minutes, start it manually from the Control Panel window.

Audit Message AUD-190: MediaGatewayManager service *service_name* failed to contact server for 10 minutes. Stopping the service.

Audit Message AUD-192: OSS with Profile Name *value1*, IP Address *value2* is successful. Value1: Profile name. Value2: IP Address.

Audit Message AUD-193: OSS with Profile Name value1, IP Address value2 is failed. Value1: Profile name. Value2: IP Address.

Audit Message AUD-194: OSS with Profile Name value1 is value2. Value1: Profile name. Value2: IP Address.

Audit Message AUD-195: The property value is changed. Value: Property name.

Audit Message AUD-196: NE (*value*) Property changed - Audit Trail Collection is Enabled/Disabled. Value: NE name.

Audit Message AUD-204: Accepted a secure port open request to IP address *IP_address*, port *number*.

Audit Message AUD-205: Accepted a user port open request to IP address *IP_address*, port *number*.

Audit Message AUD-206: User *username* logged in from IP address *IP_address*, port *number*.

Audit Message AUD-207: Rejected a user login from IP address *IP_address*, port *number*.

Audit Message AUD-208: User *username* logged out from IP address *IP_address*, port *number*.

Audit Message AUD-209: NE *ID* reported.

Audit Message AUD-2000: Cisco MGM successfully contacted NE: *name*.

Audit Message AUD-2001: Cisco MGM was unable to contact NE: *name*.

Recommended Action Check network connectivity. Log into the Cisco MGM client with SuperUser privileges and choose **Administration** > **Error Log**. Use the Error Log to debug the problem.

Audit Message AUD-2002: New node discovered and added to the database: Node IP: *IP_address* Node ID: *ID*.

Audit Message AUD-2005: New system ID: *system_ID* of NE: *IP_address* conflicts with the system ID of an existing NE.

Explanation The new system ID configured on the NE is not unique. An existing NE already has this ID, which was configured on the device side.

Recommended Action On the device side, change the host name of the misconfigured NE to a unique host name.

Audit Message AUD-2006: NE's IP address: *IP_address* has been reassigned to a different NE. *Identifiers_of_the_two_NEs*.

Explanation The IP address of an existing NE was assigned to another NE. This can occur if you take an existing NE offline and assign its IP address to another NE.

Recommended Action Delete the offline NE from Cisco MGM; then, add the other NE to Cisco MGM.

Audit Message AUD-2200: Active IP set to the primary IP.

Audit Message AUD-2201: Active IP set to the secondary IP.

Audit Message AUD-2202: Software download operation succeeded.

Audit Message AUD-2203: Software revert operation succeeded.

Audit Message AUD-2204: Software commit operation succeeded.

Audit Message AUD-2205: Software download operation failed.

Audit Message AUD-2206: Software download operation failed because it is not supported by the running agent version.

Audit Message AUD-2207: Software download operation failed because of a Flash reading/writing problem.

Audit Message AUD-2208: Software download operation failed because of a problem during transfer from the TFTP server to the master CMP.

Audit Message AUD-2209: Software download operation failed because of the standby agent version running.

Audit Message AUD-2210: Software revert operation failed.

Audit Message AUD-2211: Software revert operation failed because it is not supported by the running agent version.

Audit Message AUD-2212: Software revert operation failed because the current standby agent version is corrupted.

Audit Message AUD-2213: Software commit operation failed.

Audit Message AUD-2214: Software commit operation failed because it is not supported by the running agent version.

Audit Message AUD-2215: Software commit operation failed because the current standby agent version is corrupted.

Audit Message AUD-2216: Software download operation failed because of invalid path parameter.

Audit Message AUD-3051: Config state: Collector#: *value* Writer#: *value* DS1 Collection: *value* DS3 Collection: *value* Sonet Collection: *value* Sts Collection: *value* Vt Collection: *value* Store Non Zero Only: *value*.

Audit Message AUD-3052: Ignoring PM collection for *NE_name* for interval *time_stamp*.

Audit Message AUD-3053: Time-out error while obtaining PM data for *NE_name* for interval *time_stamp*.

Audit Message AUD-3054: PM collection failed for *string*. HTTP server too busy. (HTTP error: *string*.)

Audit Message AUD-3055: Processing NE time offset for *string*. Offset value too large *value*. So new offset value is 0.

Audit Message AUD-3056: Processing NE time offset for *string*. New offset value is *value*.

Audit Message AUD-3057: Data format error while obtaining PM data for *string* for interval *string*.

Audit Message AUD-3060: PM Comm Session is null for *NE_name*.

Audit Message AUD-3062: Exception during PM collection for *NE_name*.

Audit Message AUD-3063: Cannot write PM data for *NE_name*.

Audit Message AUD-3064: Cannot write PM data for *NE_name*, data collected was blank.

Audit Message AUD-3065: Partial replies not valid, PM collection failed for *NE_name*.

Audit Message AUD-4201: Auto Backup Job Status has: {Succeeded | Failed}.

Explanation This message informs you of the status of the automatic daily backup for each NE.

Audit Message AUD-4205: {Activate | Revert} Command Status has: {Succeeded | Failed}.

Recommended Action If the command status is Failed, check the Error Log for EID-4205 for a detailed explanation of the failure.

Audit Message AUD-5000: During circuit creation.

Recommended Action Informational message during circuit creation. No action is required.

Audit Message AUD-5001: Submit check request for deletion.

Recommended Action Informational message during circuit creation. No action is required.

Audit Message AUD-5001: The MGM Service *service name* is being started.

Recommended Action The service is being launched, but might not have started up completely. Do not perform a service Stop operation on this service again until you see the AUD-5003 message.

Audit Message AUD-5002: The MGM Service *service name* is being stopped.

Recommended Action The service is being stopped, but might not have shut down completely. Do not perform a service Start operation on this service again until you see the AUD-5004 message.

Audit Message AUD-5003: The MGM Service *service name* has connected to Service Manager.

Recommended Action The service has started. You can perform a service Stop operation.

Audit Message AUD-5003: The MGM Service *service name* has connected to Service Manager.

Audit Message AUD-5004: The MGM Service *service name* has disconnected from Service Manager.

Recommended Action The service has shut down. You can perform a service Start operation.

Audit Message AUD-5005: The MGM Service *value* has unexpectedly disconnected from Service Manager. Value: Name of service.

Audit Message AUD-5006: The MGM Service *value1* has failed to contact Service Manager for *value2* minutes. Stopping the service. Value1: Name of service. Value2: Number of minutes.

Audit Message AUD-5011: NE *name* has been added.

Audit Message AUD-5012: NE *name* has been deleted.

Audit Message AUD-5013: NE *name* has been undeleted.

Audit Message AUD-5014: NE *name* purge procedure in progress.

Audit Message AUD-5015: NE *name* has been successfully purged.

Audit Message AUD-5016: NE *name* purge procedure has failed.

Audit Message AUD-5017: NE *name* has been discovered.

Troubleshooting

This appendix offers troubleshooting steps to help solve high-level problems while operating Cisco MGM or Cisco MGM GateWay. This chapter includes the following troubleshooting information:

- C.1 Server Problems
- C.2 Client Connectivity Problems
- C.3 Client Operational Problems
- C.4 Topology Problems
- C.5 Equipment Management Problems
- C.6 Configuration Center, Chassis View, Diagnostic Center and Statistics Report Problems
- C.7 Chassis View Problems
- C.8 Configuration Management - Elements
- C.9 Connection Management Problems
- C.10 Diagnostics Center Problems
- C.11 Performance Management Collection and Parsing Problems
- C.12 Statistics Report Problems
- C.13 Service Agent Problems
- C.14 Audit Trail Log Problems
- C.15 Miscellaneous Problems

For a list of error messages, see Appendix B, “Error Messages”.

Follow the troubleshooting procedures described in this section before contacting Cisco technical support.

1. Identify the source of the problem—Which devices, interfaces, hosts, applications have the problem?
2. Locate the problem on the network—On what VLAN, subnet, or segment is the problem occurring?
3. Compare current network performance against an established baseline—Is the performance better or worse?
4. Find out when the problem started—When did you first see the problem? Is it recurring?
5. Determine the extent of the problem—How widespread is the problem? Is it getting worse?

Note This chapter assumes that the server is installed under the default /opt/CiscoMGMServer directory and the client is installed under the default /opt/CiscoMGMClient or C:\Cisco\MediaGatewayManagerClient directory. If a directory other than the default installation directory is specified, replace the default path with the installed path during setup.

C.1 Server Problems

This section describes troubleshooting procedures for the following Cisco MGM server-related problems:

- C.1.1 Cisco MGM Server Does Not Respond
- C.1.2 Cannot Connect to the Cisco MGM Server
- C.1.3 NE Connection State Is Listed as Unavailable
- C.1.4 Launching Tables Results in Database Errors
- C.1.5 SNMP Traps Are Not Forwarded from NEs
- C.1.6 Trap Port Is Unavailable
- C.1.7 NE Is Not Discovered
- C.1.8 NE Is Not Reachable
- C.1.9 NE Model Type Appears as Unknown
- C.1.10 Memory Backup, Memory Restore, or Software Download Fails
- C.1.11 Memory Autobackup, Software Commit, or Software Revert Fails

Note Log in as the root user on the Sun Solaris workstation where the Cisco MGM server is installed to perform any operations on the Solaris workstation.

C.1.1 Cisco MGM Server Does Not Respond

If the server does not respond, complete the following steps:

Step 1 Log in as the root user on the Solaris workstation where the Cisco MGM server is installed.

Step 2 Enter the following command to view the status of the Cisco MGM server processes:

```
showmgm
```

If you do not have root user privileges but you belong to the UNIX group that can use sudo functionality to run commands as non-root, enter the following command:

```
sudo showmgm
```

If there is a line containing /MGMServer, the Cisco MGM server is running.

If there is no line containing /MGMServer, the Cisco MGM server is not running. Proceed to Step 3.

Note You can also check the mgmop.log file found in /opt/CiscoMGMServer/log to check whether the server was stopped by another user or it stopped abnormally. If it stopped abnormally, proceed to Step 3.

Step 3 Run the **getinfo.sh** Cisco MGM server tool and send the data to Cisco technical support for analysis.

If you do not have root user privileges but you belong to the UNIX group that can use sudo functionality to run commands as non-root, enter the following command:

```
sudo getinfo.sh
```

Step 4 Start the Cisco MGM server by using the mgms-start script located in the /opt/CiscoMGMServer/bin directory.

a. Log in as the root user.

b. Change the directory to /opt/CiscoMGMServer/bin and enter the following command:

```
mgms-start
```

If you do not have root user privileges but you belong to the UNIX group that can use sudo functionality to run commands as non-root, enter the following command:

```
sudo mgms-start
```

If the preceding procedure does not solve the problem, complete the following steps:

Step 1 Verify that the /opt/CiscoMGMServer/cfg/MGMServer.cfg file is not corrupted. The file should contain the db-config-mode = auto parameter in the [database] section. If the entry is missing, the Cisco MGM server configuration file is corrupt. Reinstall the Cisco MGM server.

Step 2 Verify that the first entry in the /var/opt/oracle/oratab file looks similar to MGM5_0:/oraclesw/product/8.1.7:Y. If this entry is missing, the Oracle database might not be installed. The Oracle database is a prerequisite for installing the Cisco MGM server.

C.1.2 Cannot Connect to the Cisco MGM Server

If you cannot connect to the server, complete the following:

Step 1 Ping the server's IP address from the client PC/workstation.

Step 2 If the ping fails, resolve the IP connectivity problem and try again.

Step 3 SSH or Telnet to the server and log in as the root user.

Step 4 Enter the following command to verify if Cisco MGM is running:

```
showmgm
```

If you do not have root user privileges but you belong to the UNIX group that can use sudo functionality to run commands as non-root, enter the following command:

```
sudo showmgm
```

Step 5 The server should have at least the following four processes running:

```
root 3778 0.1 0.1567 9592 ? S 16:57:36 0:00 /opt/CiscoMGMServer/bin/CTMServer
root 3771 0.1 0.4 6208 pts/1 S 16:57:34 0:00 /opt/CiscoMGMServer/bin/CTMServer
root 3876 0.5 0.6129464 8648 ? R 16:58:12 SnmpTrapService
root 3798 26.8 4.115732060968 ? S 16:57:37 0:29 SMService
```

Step 6 Manually stop the server if you see fewer than four processes running. Enter the following command:

```
mgm-stop
```

Step 7 If you changed the server IP address, verify that the configuration files shown in Table 5-18 have been updated. See the "5.3.6.1 Updating the Configuration Files after Changing the Cisco MGM Server IP Address" section on page 5-42.

Step 8 Verify if the Oracle database is accepting connections.

a. Log in as the Oracle user. Enter the following command:

```
su-oracle
```

b. Open an SQLplus session:

```
omu-u60-3% sqlplus ctmanager/ctm123!
SQL*Plus: Release 8.1.7.0.0 - Production on Fri Aug 30 00:08:12 2002
(c) Copyright 2000 Oracle Corporation. All rights reserved.
Connected to:
Oracle8i Release 8.1.7.0.0 - Production
JServer Release 8.1.7.0.0 - Production
SQL>
```

Step 9 Reboot the server if you get another error message and the SQL prompt does not appear. Wait enough time for the server to boot up and try to run the client. The SQL prompt indicates that the Oracle database is running and accepting connections

Step 10 Manually restart Cisco MGM.

```
SQL> exit
Disconnected from Oracle8i Release 8.1.7.00 - Production
JServer Release 8.1.7.0.0 - Production
omu-u60-3% exit
omu-u60-3% logout
mgms-start
```

If you do not have root user privileges but you belong to the UNIX group that can use sudo functionality to run commands as non-root, enter the following command:

```
sudo mgms-start
```

Step 11 Wait for 5 minutes and run the client.

C.1.3 NE Connection State Is Listed as Unavailable

If the connection state of an NE is listed as Unavailable in the Domain Explorer window, a connectivity or configuration problem exists. Wait 5 to 10 minutes after adding the NE to the Cisco MGM domain; then, complete the following steps:

Step 1 To see the NE IP address, select the NE in the Domain Explorer window. The Address tab of the Network Element Properties sheet lists the IP address of the selected NE.

Step 2 From the Cisco MGM server, enter the following command to verify connectivity between the Cisco MGM server and the NE:

ping *IP_address*

Step 3 If the ping fails, a physical or configuration problem exists in the communication between an NE and Cisco MGM.

Step 4 If the ping succeeds, verify that the NE software version is listed in the Supported NE Table.

Step 5 SNMP read and write community strings must be set up properly on each NE. To view the community string, enter:

```
dspsnmp
```

The community strings configured on the server should match the strings configured on the NE. For information on configuring community strings in Cisco MGM.

C.1.4 Launching Tables Results in Database Errors

If the Oracle database or Oracle listener that Cisco MGM is using is down, launching tables will generate database errors. To troubleshoot table launching errors:

Step 1 Log in as the Oracle user and enter the following command:

```
sqlplus ctmanager/ctm123!
```

If login is successful, an SQL> prompt appears, which indicates that the Oracle database has been installed and the database server is up and running. If login fails, either the Oracle database has not been installed or the database server is not running.

Step 2 To start the Oracle database, log into the Solaris workstation as the Oracle software owner user.

Step 3 Enter the following command at the shell prompt to start the Oracle database:

```
dbstart
```

Step 4 Enter the following command at the shell prompt to start the Oracle listener:

```
lsnrctl start
```

If there are still problems with starting the Oracle database or the Oracle listener, refer to the Oracle documentation or contact Oracle support.

C.1.5 SNMP Traps Are Not Forwarded from NEs

SNMP traps might not be forwarded, either because the trap port is already in use, or because the NE is not properly configured.

C.1.6 Trap Port Is Unavailable

The Cisco MGM server requires exclusive access to the SNMP trap port to receive SNMP traps from the NE.

Step 1 To verify that the standard SNMP trap port (number 162) is not being used by another application running on the same Solaris workstation, enter the following command:

```
netstat -a | grep 162
```

If the following line is seen, the SNMP trap port is being used by another application:

```
*.162 Idle
```

Step 2 If the trap port is being used by another application, you must stop the other application.

C.1.7 NE Is Not Discovered

If Cisco MGM cannot discover an NE, complete the following steps:

Step 1 Verify that the NE is up and running.

Step 2 Verify that the NE IP address and default route are configured correctly.

C.1.8 NE Is Not Reachable

If Cisco MGM cannot reach an NR, complete the following steps:

Step 1 Verify that the NE is up and running.

Step 2 Verify that the NE IP address and default route are correctly configured.

Wait for five poll cycles while Cisco MGM reestablishes connectivity with the NE.

Step 3 To test IP connectivity to the NE from the Cisco MGM server, enter the following command from the Solaris workstation running Cisco MGM:

```
ping NE_IP_address
```

Step 4 Verify that the username and password that Cisco MGM uses to reach the NE exist on the NE.

C.1.9 NE Model Type Appears as Unknown

If an in-service NE is added to the Domain Explorer, but the model type appears as unknown, the software version of the NE might not be prepopulated in the database. In other words, Cisco MGM cannot match the NE with a recognizable version.

C.1.10 Memory Backup, Memory Restore, or Software Download Fails

Complete the following steps if memory backup, memory restore, or software download fails:

Step 1 Log into the Cisco MGM client with the appropriate user profile.

Step 2 In the Domain Explorer window, choose **Administration** > **Job Monitor**. The Job Monitor Table shows the status of the operation. The reason for the failure is shown in the Additional Information column.

Step 3 Return to the Domain Explorer window and choose **Administration** > **Error Log**. The Error Log shows information about the backup, memory restore, or download failure.

Step 4 Refer to the "B.2 Cisco MGM Server Error Messages" section on page B-61 for the correct action to take in response to the error.

C.1.11 Memory Autobackup, Software Commit, or Software Revert Fails

If memory autobackup, software commit, or software revert fails, use this procedure to troubleshoot the failure:

Step 1 Log into the Cisco MGM client with the appropriate user profile.

Step 2 In the Domain Explorer window, choose **Administration** > **Audit Log**. The Audit Log shows the status of the operation.

Step 3 Return to the Domain Explorer window and choose **Administration** > **Error Log**. The Error Log shows the reason for the failure.

Step 4 Refer to the "B.2 Cisco MGM Server Error Messages" section on page B-61 for the correct action to take in response to the error.

C.2 Client Connectivity Problems

The Cisco MGM client might not be able to connect to the Cisco MGM server for various reasons. Complete the following procedures in the order listed until the problem is resolved:

- C.2.1 Database Is Not Available
- C.2.2 Database Timeout Occurred
- C.2.3 Are the Cisco MGM Client and the Cisco MGM Server Connected?
- C.2.4 Cannot Log In as Provisioner or Operator
- C.2.5 “Cannot Authenticate User” Message Appears

C.2.1 Database Is Not Available

If the Cisco MGM client cannot connect to the Cisco MGM server, verify that the database is available.

Step 1 Log into the Cisco MGM server as the Oracle user.

Step 2 Enter the following command to connect to the database:

```
sqlplus ctmanager/ctm123!
```

Step 3 If the error message “maximum processes exceeded” is received, the maximum number of database connections have been reached. Close several clients or ask the database administrator to increase the maximum number of processes for the database.

C.2.2 Database Timeout Occurred

If a database timeout occurred, complete the following:

Step 1 Reduce the scope of the query by selecting a group or a network element and not the entire domain before opening tables such as the Alarm Browser, Alarm Log, and Audit Log.

Step 2 Increase the client database query timeout period by editing the ems-client.cfg file located at C:\Cisco\MediaGatewayManagerClient\config, /opt/CiscoMGMClient/config, or other directory where the client was installed.

Step 3 Add hardware resources to the Oracle database server.

Step 4 Ping the Oracle database server from the client to verify the response time. Increase the bandwidth if the round-trip response time is inadequate.

C.2.3 Are the Cisco MGM Client and the Cisco MGM Server Connected?

If the database is available, check connectivity between the client and the server:

Step 1 To see the Cisco MGM server IP address, enter the following command on the Solaris workstation that is running the Cisco MGM server:

```
ifconfig -a
```

The command output looks similar to the following example:

```
hme0:flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST>mtu 1500
inet 192.168.120.93 netmask ffffff00 broadcast 192.168.120.255
```

The IP address is the address following the inet field.

Step 2 To verify that the physical connection between the Cisco MGM client and the Cisco MGM server does not have problems, enter the following command from the Cisco MGM client:

```
ping IP_address
```

where the IP address belongs to the Solaris workstation that runs the Cisco MGM server.

Step 3 If the ping command is not successful, fix the physical connectivity; then, log into the Cisco MGM client.

C.2.4 Cannot Log In as Provisioner or Operator

Complete the following steps if the user cannot log in as a Provisioner or Operator:

Step 1 Use the default username and password to log into the Cisco MGM client:

Username: **SysAdmin**

Password: **MGM123!**

Step 2 If system administrator login is successful, but Provisioner or Operator login was not, verify that the Provisioner or Operator exists and is not disabled. In the Domain Explorer window, choose **Administration > MGM Users** to view a table of all configured Cisco MGM users.

Step 3 If the Provisioner or Operator is not in the Cisco MGM Users table, the user is not configured. Configure the Provisioner or Operator; then, log in as that user.

Step 4 If the Provisioner or Operator is in the Users table, select the row corresponding to that user and click the **Modify User Properties** tool to bring up the Modify Cisco MGM User Properties wizard. Verify that the admin state is enabled. If the admin state is disabled, enable it and log in as the Provisioner or Operator. The user might have been disabled after attempting to log in with an incorrect password.

Step 5 If the password is not correct, set a new password for the user and log in again.

C.2.5 "Cannot Authenticate User" Message Appears

If the "Cannot authenticate user" error message is received when logging into the Cisco MGM client, the Cisco MGM server might be initializing. Wait for five minutes while the Cisco MGM server finishes initializing; then, try to log in again. Alternately, check your username and password and enter them again. The username and password are case sensitive.

C.3 Client Operational Problems

Procedures for troubleshooting client operational problems are provided in the following sections:

- C.3.1 Cannot Delete an NE
- C.3.2 Added a New Software Version to the Wrong NE
- C.3.3 Cannot Schedule Jobs
- C.3.4 Cannot Customize the Network Map
- C.3.5 Color Settings when the Cisco MGM Client Is Run on a Sun Ultra 5 Workstation?
- C.3.6 How Do I Collect Thread Dumps?
- C.3.7 Launching Help on a Solaris Client

C.3.1 Cannot Delete an NE

If an NE cannot be deleted, verify that the user logged in as SuperUser or NetworkAdmin—not as a Provisioner or Operator. Provisioners and Operators cannot delete NEs. If the user logged in as Provisioner or Operator, restart the Cisco MGM client session and log in as SuperUser.

C.3.2 Added a New Software Version to the Wrong NE

If a new software version is added to the wrong NE:

Step 1 In the Supported NE Table, delete the incorrect entry.

Step 2 Select the correct NE row from the Supported NE Table.

Step 3 Add the correct software version.

Step 4 In the Domain Explorer, Network Element Properties, set the operational state of all NEs that are behaving erroneously to **Out of Service**.

Step 5 Click **Save**.

Step 6 In the Network Element Properties, set the operational state of all the NEs back to **In Service**.

C.3.3 Cannot Schedule Jobs

The Cisco MGM client is used to schedule three types of administrative tasks:

- Software download
- Memory backup
- Memory restore

Cisco MGM maintains an Error Log and audit log to track potential problems. To view the Error Log or audit log:

Step 1 In the Domain Explorer window, choose **Administration** > **Audit Log** or **Administration > Error Log**.

Step 2 Look for errors related to software download, memory backup, or memory restore.

C.3.4 Cannot Customize the Network Map

If an image file is not displayed while changing the Network Map background or while changing a node icon, complete the following steps:

Step 1 Choose another image file. The file might be corrupt.

Step 2 Check the size of the image file. The image file might be larger than 100 KB, which is too big to load. If the file is too big, use a smaller image file.

Step 3 Verify that the image file exists in the \images\mapbkgnds\shapefiles directory or the *MGM_client_install_directory*\images\mapicons directory. If the file is missing, it has been deleted. Reinstall the Cisco MGM client.

Note The client is bundled primarily with shape files (*.shp) and only a few map background GIF files.

C.3.5 Color Settings when the Cisco MGM Client Is Run on a Sun Ultra 5 Workstation?

To run the client on a Sun Ultra 5 workstation, the color map must be changed from 8 bit to 24 bit. If the colors do not look right, change the color map from 8 bit (the default) to 24 bit as follows:

Step 1 To see the current color settings, enter the following command:

```
/usr/sbin/m64config -prconf
```

Command output looks similar to the following example:

```
--- Hardware Configuration for /dev/fbs/m640 ---
ASIC: version 0x7c004750
DAC: version 0x0
PROM: version 104
Card possible resolutions: 720x400x88, 640x480x60, 640x480x72, 640x480x75, 800x600x56,
800x600x60, 800x600x72, 800x600x75, 1024x768x87, 1024x768x60, 1024x768x70, 1024x768x75,
1280x1024x75, 1280x1024x60, 1152x900x66, 1152x900x76, 1280x1024x67, 1280x800x76,
1280x1024x85
1280x1024x76, 1152x864x75, 1024x768x77, 1024x800x84, vga, svga, 1152, 1280, 800x600,
1024x768, 1280x1024, 1152x900
Monitor possible resolutions: 720x400x70, 720x400x88, 640x480x60, 640x480x67, 640x480x72,
640x480x75, 800x600x56, 800x600x60, 800x600x72, 800x600x75, 832x624x75, 1024x768x60,
1024x768x70, 1024x768x75, 1280x1024x75, 1152x870x75, 1152x900x66, 1152x900x76,
1280x1024x67, 1280x1024x76, vga, svga, 1152, 1280, 800x600, 1024x768, 1280x1024, 1152x900
Possible depths: 8, 24
Current resolution setting: 1280x1024x76
Current depth: 8
```

Step 2 To change the color setting to 24 bit, log in as the root user and enter the following commands:

```
su
Password: password
/usr/sbin/m64config -depth 24 -res 1152x900x76
```

Step 3 Reboot the workstation for the new color settings to take effect.

Note The resolution in 24-bit depth is a little lower than is possible with 8-bit depth (1152 x 900 x 76 versus 1280 x 1024 x 76), but the difference is hardly noticeable.

C.3.6 How Do I Collect Thread Dumps?

Thread dumps are helpful references when debugging the Cisco MGM process. To collect thread dumps:

Step 1 Log into the server workstation as the root user.

Step 2 On the command line, enter the following:

thread_dumper [\<*Group/Service*>\]

where:

- *Group* is the group name for which to collect thread dumps. It can be:
  - SM
  - SNMPTRAP
  - NE
  - PM
  - GW

- *Service* is the service name for which the thread dump is required. It can be:
  - SMService
  - SNMPTrapService
  - CORBAGWService
  - MGX8880NEService
  - MGX8850NEService
  - UnmanagedNEService

C.3.7 Launching Help on a Solaris Client

To launch help on a Solaris Client, Netscape must be in the PATH environment variable.

To check this:

Step 1 Change to a C-Shell, enter the following command:

```
# csh
```

Step 2 Check to see if Netscape is in the PATH environment, enter:

```
# which netscape
```

If the error message 'Command not found' is received, Netscape is not in the PATH environment.

You can also try to locate the path for Netscape, and check the version. On Solaris 8 machines, the default location is /usr/dt/appconfig/netscape. If Netscape is available, you will see:

```
# /usr/dt/appconfig/netscape/netscape  -version Netscape 4.76/U.S., 06-Oct-00; (c)
1995-2000 Netscape Communications Corp.
```

Step 3 To add Netscape to the PATH environment variable, enter:

```
# setenv PATH /usr/dt/appconfig/netscape:${PATH}
```

To make this change permanent, add the following line to /.cshrc file:

```
# setenv PATH /usr/dt/appconfig/netscape:${PATH} .cshrc
```

Step 4 Launch the Cisco MGM client, enter:

```
# /opt/CiscoMGMClient/mgmc-start
```

C.4 Topology Problems

This section includes the following information:

C.4.1 Discovery Mechanism

C.4.2 Discovery Issues at Startup

C.4.1 Discovery Mechanism

Cisco MGM manages the PNNI network. The ILMITopoc process discovers the physical PNNI network using SNMP protocol. All the discovered nodes are displayed in all the MGX NE GUIs such as Configuration Center (CC), Diganostic Center (DC), Statistics Report (SR), Chassis View (CV) GUI. Cisco MGM is notified of all subsequent changes in the network through traps for MGX nodes.

Once the ILMITopoc process discovers all the nodes, it sends all the nodes to topod process. Topod then sends these nodes and trunks to other processes in Cisco MGM such as ooemc, NMServer, nts etc.

C.4.2 Discovery Issues at Startup

This section includes the following information:

- C.4.2.1 No Nodes Are Discovered
- C.4.2.2 Node Name Is Incorrect in Database
- C.4.2.3 Node IP Is Incorrect in Database
- C.4.2.4 Node Alarm Shown Incorrectly in Database
- C.4.2.5 Reachable Node Is Shown as Unreachable
- C.4.2.6 Cisco MGM State Is Incorrect

C.4.2.1 No Nodes Are Discovered

No nodes are in the Cisco MGM database.

Step 1 Verify that the nodes are ip reachable. Get the primary ip of the node by issuing the CLI commands **dspndparms** and **dspipif**. Then check if the node is ipreachable from Cisco MGM.

This can be done by doing a ping <node ip address>.

Step 2 If the nodes are ip reachable from Cisco MGM, verify that the community strings of the gateway nodes are correct.

This can be done by issuing the command **dspsnmp** on the switch CLI of the node that is not getting discovered. Compare this community string with that in the node_info table. The community string in the node_info table is encrypted. You will need to decrypt this string and verify it.

Step 3 If it is a MGX2 node and If persistent topology is enabled on the switch gateway and some nodes in a peer group are not getting discovered, verify that persistent topology is enabled on the gateway in the peer group using the CLI dsptopogw. If the gateway flag is enabled then verify in the node is part of the list of nodes on the gateway using the CLI command dsptopondlist

Defect Information—Collect the following information for further analysis:

- Save topod.log, ILMITopoc.log
- Collect the data in node_info table.
- Collect the output of dspndparms, dspsnmp, dspipif on the MGX node.

Possible alternative workaround—None

C.4.2.2 Node Name Is Incorrect in Database

The node name of the standalone MGX node is incorrect.

Step 1 If the node table has the name correct

- Dump the cache of topod and ILMITopoc. This can be done by issuing a kill -USR1 to the process. From the dump verify which process has the information incorrectly. If the information is correct in all these processes then open a new GUI and verify if the problem still exists.

Step 2 If the node table does not have the name correctly

- Check the ILMITopoc.log file to see from which node it got the wrong information.
- Do an snmpget -c <community> <ipAddress> 1.3.6.1.2.1.1.5. Verify that the name received as a response is correct. If it is not then verify the name on the switch.

Defect Information—Collect the following information for further analysis:

- Save the ILMITopoc.log and topod.log
- Collect the dump outputs of ILMITopoc, topod. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.4.2.3 Node IP Is Incorrect in Database

The ip Address of a node is not shown correctly.

Step 1 If the node table has the ipAddress correct

ßDump the cache of topod and ILMITopoc. This can be done by issuing a kill -USR1 to the process. From the dump verify which process has the information incorrectly. If the information is correct in all these processes then open a new GUI and verify if the problem still exists.

Step 2 If the node table does not have the ipAddress set correctly:

- In Cisco MGM, since the node does not have any PNNI trunks and the persistent topology feature is not enabled on this node, by default this node will be managed using the lan ip address. Verify if this is the case.

Defect Information—Collect the following information for further analysis:

- Save ILMITopoc.log and topod.log
- Save the dump outputs of ILMITopoc, topod. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.4.2.4 Node Alarm Shown Incorrectly in Database

The node alarm state of a node is incorrect.

Step 1 Check the cache of topod and ILMITopoc.

Dump the cache of topod, ILMITopoc. This can be done by issuing a kill -USR1 to the process. From the dump verify which process has the information incorrectly.

Step 2 If the node table does not have the node alarm status set correctly:

- Check the ILMITopoc.log file
- do an snmpget -c <community string> <ipAddress>1.3.6.1.4.1.351.110.1.1.14

This will return the alarm state of the node. 1 - Clear, 2- Minor, 3 - Major, 4- Critical

Defect Information—Collect the following information for further analysis:

- Save ILMITopoc.log, topod.log
- Save the dump outputs of ILMITopoc, topod. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.4.2.5 Reachable Node Is Shown as Unreachable

Node that is reachable from Cisco MGM is shown as unreachable on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 If the node table has alarm state of this node as minor, major, critical or clear:

- Dump the cache of NMServer,Topod and ILMITopoc. To dump the cache issue a kill -USR1 signal to the process. Check the dumps in the /opt/svplus/log directory and verify if the node alarm status is correct in the cache dumps. If the alarm status is correct in the cache dump then open a new GUI and check if the node shows in the correct alarm status in that GUI.

Step 2 If the node table has alarm state of an MGX node as unreachable:

- Verify that the node is ipreachable from Cisco MGM

Ping the active ip address of the node. The active ip will be the ip address of the node that is populated in the node table.

- Verify that the community string in the node_info table is the same as the community string on the node. The community string of a node can be got using the CLI dspsnmp.
- Check nts logs to see if nts has declared the node as reachable. See C.15.1 NTS. If nts has declared the node as reachable, check the topod.log for "nonRoutingNodeMsg" for this node. Verify that the alarm status in this message is the correct alarm status

Defect Information—Collect the following information for further analysis:

- Save ILMITopoc.log, topod.log, NMServer.*.log, nts.*.log, ooemc*log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.4.2.6 Cisco MGM State Is Incorrect

The management state of the node in the node table (column mgmt_state) shows as DOWN (2) or UNKNOWN (0) even when the node is reachable by IP.

Step 1 Check the trap manager registration of the Cisco MGM station on the node.

Login to the node and do a "dsptrapmgr" to check if the particular Cisco MGM station has registered to the node for traps. This is necessary for the node to be declared as manageable (mgmt_state = UP).

Step 2 Check the community strings of the node in the node-info table.

a. Enter the community strings (SNMP-GET and SNMP-SET) of the node through the Domain Explorer GUIs "NE Authentication" tab. They may have been incorrect in the node-info table. This can be verified if the decrypt tool for the encrypted strings in the database is available.

b. Check in NTS.log to see if trap registration has been successful for the node. See C.15.1 NTS.

Defect Information—Collect the following information for further analysis:

- Save ILMITopoc.log, topod.log and ooemc*.log

Possible alternative workaround—None

C.4.3 Discovery Issues at Runtime

This section includes the following information:

- C.4.3.1 Node Added Not Shown in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs
- C.4.3.2 Node Name Change Not Getting Updated in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs
- C.4.3.3 Node IP Address Change Not Getting Updated in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

C.4.3.1 Node Added Not Shown in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

Dynamically added Route routing node not shown on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

Step 1 If the node table has an entry for the node

- Dump the cache of NMServer, Topod and ILMITopoc. To dump the cache issue a kill -USR1 signal to the process. Check the dumps in the /usr/user/svplus/log directory and verify if the node is present in the cache dumps. If the node is present then open a new GUI and check if the node shows in that GUI.

Step 2 If the node table does not have an entry for the node

- Check ILMItopoc log and verify if it received a 70005 and 70201 (in case persistent topology feature is turned enabled).
- If you see the trap in the log, verify that ILMITopoc's snmp requests issued after receiving the trap are successful. If the snmp is not going through verify if the newly added node is ip and snmp reachable from Cisco MGM.
- If you do not see any of these traps in the ILMITopoc.log, see C.15.1 NTS.

Defect Information—Collect the following information for further analysis:

- Save ILMITopoc.log, topod.log, NMServer.log, nts.*.log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—Add the node again to the network by first deleting it and then adding it again.

C.4.3.2 Node Name Change Not Getting Updated in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

Changes in the name of a node not reflected on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 If the node table has an entry for the node with the correct name

- Dump the cache of NMServer, Topod and ILMITopoc. To dump the cache issue a kill -USR1 signal to the process. Check the dumps in the /usr/user/svplus/log directory and verify if the node name is correct in the cache dumps. If the node name is correct in the cache dump then open a new GUI and check if the node shows in that GUI.

Step 2 If the node table does not have an entry for the node with the correct name

- Check ILMItopoc.log and verify if it received a 60006 and 70202
- If you see the trap in the log, verify that ILMITopoc's updates its cache based on this trap. If it fails to update the node name then ILMITopoc.log will contain "%ILMITopoc-3-updateFailed: <Node_c::updateName> Failed to update node name."
- If you do not see any of these traps in the ILMITopoc.log, see C.15.1 NTS.

Defect Information—Collect the following information for further analysis:

- Collect ILMITopoc.log, topod.log, NMServer.*.log, nts.*.log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.4.3.3 Node IP Address Change Not Getting Updated in Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

The ip address of the node does not get updated dynamically on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 If the node table has an entry for the node with the correct ip address.

- Dump the cache of NMServer, Topod and ILMITopoc. To dump the cache issue a kill -USR1 signal to the process. Check the dumps in the /opt/svplus/log directory and verify if the node name is correct in the cache dumps. If the node name is correct in the cache dump then open a new GUI and check if the node shows in that GUI.

Step 2 If the node table does not have an entry for the node with the correct ip address

- Check ILMItopoc.log and verify if it received a 60007 and 70202
- If you see the trap in the log, verify that ILMITopoc's updates its cache based on this trap.
- If you do not see any of these traps in the ILMITopoc.log, see C.15.1 NTS.

Defect Information—Collect the following information for further analysis:

- Collect the ILMITopoc.log, topod.log, NMServer.*.log, nts.*.log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.5 Equipment Management Problems

This section includes the following information:

- C.5.1 Sync Up Issues
- C.5.2 Cisco MGM DB and Switch Data Inconsistency Issues After Node Provisioning for MGX

C.5.1 Sync Up Issues

This section includes the following information:

- C.5.1.1 EM Declares Successful Node Re-sync When Node Mode Is 3
- C.5.1.2 Network Setup and Configuration Required for OOEMC Sync Up Process
- C.5.1.3 Node Mode Remains in 1
- C.5.1.4 Node Mode Remains in 2
- C.5.1.5 Node Resync Mode is 5
- C.5.1.6 Cisco MGM DB Inconsistent With Switch Data After Successful Coldstart (Cisco MGM Server stop/start) or Periodic Resync
- C.5.1.7 Cisco MGM CM GUI Shows Incomplete Connections After Successful Node Resync and Dbroker Sync Up
- C.5.1.8 Cisco MGM GUI Shows Mismatched Information Between GUI Views and DB Data

C.5.1.1 EM Declares Successful Node Re-sync When Node Mode Is 3

MGX nodes are managed by OOEMC component in Cisco MGM. Equipment Management (EM) uses coldstart, warm start, and periodic resync to sync up network data. Each of these resync methods will involve configuration file upload, parsing, and DB population. Node mode in node table indicates the state of the sync up process. The possible node modes are 1, 2, 3 and 5. Expected mode for a successful node resync is 3. If the node mode stays in other mode for a long period of time, it indicates some kind of resync problem. Keep in mind that any sync up problem could be caused by switch, SNMP, FTP, and OOEMC itself. User needs to branch out to different areas for identifying the root cause of any sync up problem.

The following is the flow of events which are involved in OOEMC coldstart sync up process:

1. Topo process discovers a node in the network. The process will change the node mode in node DB table to -1. Then it notifies OOEMC component for the discovery. Then OOEMC will change the node mode from -1 to 1 after the component starts managing the node.
2. When NTS component is able to register with the node, it sends link up message to the OOEMC which manages the node. The OOEMC component will change the node mode from 1 to 2 to signify the start of node sync up.
3. The OOEMC component sends SNMP bulk file creation request to the switch. If the request is allowed, the switch will send trap 60901 to the Cisco MGM to signify the start of bulk file creation. When bulk file creation is completed on the switch, the switch will send trap 60902 to the Cisco MGM. After Cisco MGM has received this trap, it will start the FTP of the config upload files.
4. f the upload and parsing of all config files have completed without error, the OOEMC will change the node mode from 2 to 3. If the upload or parsing of config upload for any service module on the switch, the node sync up will complete partially and the OOEMC will change the node mode from 2 to 4 at the end of the node sync up process. If the error occurs on the shelf generic card file (CARD_01_CC.CF) or pnni file (PNNI_01_CC_CF), the OOEMC will change the node mode from 2 to 5 to signify node sync up failure.

C.5.1.2 Network Setup and Configuration Required for OOEMC Sync Up Process

There are network setup and Cisco MGM configuration prerequisite required by EM before it can start sync up process. On the switch, the following is the check list for trap manger and trap IP setup:

Use CLI "dsptrapmgr" to check that the Cisco MGM IP has been added to the trap manager. If you find that your Cisco MGM IP is not registered with the switch, add the Cisco MGM IP to the trap manager by typing the CLI "addtrapmgr cwm_ip 2500" where 2500 in the command is the port number and cwm_ip is the IP address of your Cisco MGM machine. You may need to delete other IP from the trap manager list if the list has been full. If the list is not full, the registration will take place automatically if the Cisco MGM is configured to manage the node.

The trap IP should have been configured on the switch properly. Whenever you configure the switch to use whatever IP (atm0 IP or lnPci0 IP) of the switch as primary IP, the topology component of Cisco MGM should use that IP for node discovery. You can display the primary and secondary IP information of the switch by typing CLI "dspndparms". To configure primary and secondary IP, you can enter "cnfndparms" and the CLI will prompt you for options. After you have set up the primary and secondary IP, you should also configure the primary IP as trap IP on the switch by entering CLI "cnftrapip configured_IP" where configured_IP is the IP that you have chosen to use as primary IP in CLI "cnfndparms".

On the Cisco MGM, the following is a list of configurable parameters in the file /opt/svplus/config/emd.conf of your Cisco MGM machine that you should set up for proper problem logging:

"OODebug" : For debugging purpose, this parameter should be set to level 6 or above, e.g. the log level statement in emd.conf should be "OODebug Level 6".

"OOKeep" : For debugging purpose, this parameter should be set to a value depending on how many log files you want to keep, e.g. the statement in emd.conf should be "OOKeep 100 OOEMC log files per oochild"

Sometimes, a different network environment requires other parameters in the same files to be tuned for correct functioning of Cisco MGM.

C.5.1.3 Node Mode Remains in 1

The node has been discovered by network topology process in Cisco MGM and its node mode has been changed from -1 to 1 in node table entry, but it stays in mode 1 for a long period of time.

Step 1 If the Cisco MGM stays in mode 1 for a long time after Cisco MGM core has been started, you need to check the trap manger on the switch. See C.5.1.2 Network Setup and Configuration Required for OOEMC Sync Up Process for trap manager and trap IP setup.

Step 2 If steps 1 is not an issue, then check for rtm link up message that NTS sends to EMD. OOEMC will start node resync once EMD notifies OOEMC that the node is active. Therefore, the second step for debugging this mode 1 problem is to see whether rtm link up message has been received by EMD and whether it has been forwarded to OOEMC.

For example, to find out the rtm link up messages received by EMD for node with id 9, do the following

grep RTM_LINK_UP emd* | grep "Node id 9"

Once the location of the rtm link up message is found in the log, view the log file for more information on notification to OOEMC

Step 3 If rtm link up message for the node is found and the log indicates that notification to OOEMC has been sent, then collect log files and report the problem.

Step 4 If rtm link up message cannot be found, then search for link down message. Grep "RTM_LINK_DOWN" from emd log files. If rtm link down message is found, then the node is not reachable to the NTS process. Check with the network administrator and see C.15.1 NTS if "RTM_LINK_UP" and "RTM_LINK_DOWN" messages are not found.

Defect Information—Collect ooemc and nts log files under /opt/svplus/log.

Possible alternative workaround—None

C.5.1.4 Node Mode Remains in 2

After rtm link up message has been received by EMD and node active message has been sent to OOEMC, OOEMC will change the node mode from 1 to 2 and trigger node resync. Depending on the switch configuration and network activities, the node resync time varies. If the node mode stays in mode 2 for longer than the node resync normally takes, there can be the problem with node resync process.

Step 1 The debugging process for this problem is mainly focus on log file inspection. Make sure that log level of all related Cisco MGM processes is set at right level. See C.5.1.2 Network Setup and Configuration Required for OOEMC Sync Up Process Cisco MGM configuration.

Step 2 The first thing to check is "cd" to "/opt/svplus/tmp" to check for configuration upload files. For example, if the node's node_id is 9, then do "ls -ltr *.9" to see what files have been uploaded for this node. If you see some files have been uploaded for this node, then the node resync is still proceeding. Make sure that the time stamps for these files refer to current time. Refer to step 6 for list of config upload files.

Step 3 If you don't see any file being uploaded from step 1, it is possible that the trap IP on the switch does not match the IP that is being used for node discovery. Or there is SNMP request failure. First check the trap IP. On the Cisco MGM, find the Managed IP that is used for node discovery by using Cisco MGM CLI "dbnds". Then use switch CLI "dsptrapip" to display the trap IP. If there is mismatch, use switch CLI "cnftrapip" to reconfigure the trap IP to the one that is used by Cisco MGM. See C.5.1.2 Network Setup and Configuration Required for OOEMC Sync Up Process.

Step 4 If the trap IP is not an issue, then check whether there is SNMP request failure. Normally, after node resync is triggered, OOEMC will send SNMP request to the switch to start configuration upload file creation. If the request fails, then OOEMC will retry SNMP request until it exceeds maximum retrials and declares node resync failure with node mode equal to 5. However, it shouldn't take very long to declare node resync failure because of the SNMP request failure. To verify that there is SNMP failure, you can start with ooemc log files and then proceed to check snmpcomm log files.

The child ID is calculated from the following formula remainder (NEDBACCSSID / No. of OOEMC child) + 1

The file name format of OOEMC log file is given as ooemc10.6568.log for example. The "10" in the example is the "child" ID, The "6568" in the examples is the OOEMC process ID which you can obtain by using typing "psg em" at Cisco MGM CLI.

The starting point of log file inspection is to grep "RESYNC" of the log file. The grep result should include node_id and node mode. Once you have locate the starting point in the file, open the file and read the content after this starting point in the file. More or less, the log messages in the file should provide you some information whether SNMP failure has occurred.

Step 5 Very often, the node mode 2 problem is caused by bulk file creation abort on the switch. Referring to the discussion in step 4, if there is no SNMP request failure, the switch should send traps 60901 and 60902 to OOEMC. Trap 60901 indicates that the switch will start bulk file creation, while trap 60902 indicates bulk file creation done. When OOEMC receives trap 60902, it will start FTP the bulk file which is shelf generic configuration file in this case. This is also the first file to be uploaded for every resync mode, whether it is coldstart, warm start or periodic resync. The commonly seen mode 2 problem is that the switch will abort the bulk file creation and send trap 60903 to Cisco MGM. Cisco MGM will reschedule the next SNMP request unless it exceeds maximum retrials. Whenever you find trap 60903 periodically in the log file, you should contact platform team to investigate the bulk file creation failure on the switch.

Step 6 To take CARD_01_CC.CF.10 as an example. This file is shelf generic file and is the first file to be uploaded after Cisco MGM has received 60902 trap from the switch. The "10" in the example is the node_id. If you find 60902 in the log file but no config file has been uploaded after a reasonable amount of time, it is possible that the FTP has failed. By greping "to ftp file" and the config file name, or just "FTP" from the log files, and by tracing the log messages in the log file, you should be able to tell whether or not FTP failure has occurred. For more detail information of SNMP request failure and FTP failure, inspect "snmpcomm" and "cwmftpd" log files Look into cwmftp.log and cwmftp.request_log. Search for the file name at the time the error happened in both files. The cwmftp.request_log gives the summary/final result of the FTP operation and any error is reported. The cwmftp.log shows the step by step details about the FTP operation.

Cisco MGM will upload and parse a set of config files from the switch. The following lists the files uploaded from MGX NE.It includes VISM, AXSM, VXSM, SRM, and RPM/RPM-PR cards:

1. CARD_01_CC.CF
2. SM_1_slot#.CF
3. SM_1_slot#.CS
4. SM_CARD_01_slot#.CF
5. SM_CONN_01_slot#.CF
6. SM_ALARM_01_slot#.CF
7. SM_CON_UPDATE_01_slot#.CF
8. SM_CARD_01_SRM.CF
9. SM_CARD_01_RPM.CF

10. PNNI_01_CC.CF

Files 1 and 2 are uploaded for each NBSM. Files 4 to 7 are uploaded for each AXSM. File 9 is uploaded for all RPM/RPM-PR cards on the switch.

The following list the files uploaded from MGX NE for VISM, AXSM, VXSM, SRM, RPM/RPM-PR, and RPM-XF cards:

1. CARD_01_CC.CF
2. SM_1_slot#.CF
3. SM_1_slot#.CS
4. SM_CARD_01_slot#.CF
5. SM_CONN_01_slot#.CF
6. SM_ALARM_01_slot#.CF
7. SM_CON_UPDATE_01_slot#.CF
8. SM_SC_slot#_transactionID_date.CF
9. SM_IC_slot#_transactionID_date.CF
10. SM_CARD_01_SRM.CF
11. SM_CARD_01_RPM.CF
12. PNNI_01_CC.CF

The different between these two lists is on the files uploaded for AXSM cards and RPM-XF card. For switch running 4.0 or above switch software, static file (SM_SC_slot#_transactionID_date.CF) and incremental file (SM_IC_slot#_transactionID_date.CF) are uploaded, but for switch running 3.0 or lower switch software, conn, alarm and conn update files are uploaded for each AXSM. Files 4 to 7 in the second list are uploaded for each RPM-XF card, and file 11 is uploaded for all RPM/RPM-PR cards on the switch.

Step 7 Another scenario that the node mode stays in 2 for very long time is because the parsing of one particular config upload file has taken very long time and has not completed yet. You can "tail" the ooemc log file by doing "tail -f ooemc_log_file" and get a feeling on what is going on with the parsing.

Defect Information—Collect ooemc log files, nts log files, snmpcomm log files, and cwmftpd log files under /opt/svplus/log.

Possible alternative workaround—None

C.5.1.5 Node Resync Mode is 5

Node syncup failure with mode 5

Step 1 Node mode 5 indicates that node resync fails. This could be caused by the config upload or parsing failure of shelf generic file (CARD_01_CC.CF.13 for example) or pnni file (PNNI_01_CC.CF.13 for example). For the upload issue, in ISS: Node Mode Remains in 2 we have touched on the "mode 5" issue. Refer to that section for more debugging information. In general, mode 5 signifies that problem has happened on one or more stages of the whole resync process. You can think of the resync process being composed of the following stages and each stage alone can lead to mode 5 problem:

1. OOEMC will trigger node resync.
2. OOEMC will send SNMP request to switch for bulk file creation

3. OOEMC will receive bulk file creation related traps: 60901, 60902, and 60903.
4. OOEMC will FTP config upload files from switch after it has received 60901 and 60902 from switch.
5. OOEMC will parse the config upload files
6. OOEMC will declare sync up done.

When mode 5 problem occurs on one of the nodes, you should ask yourself the following questions:

1. Is the problem caused by SNMP request? What can I do?

You can grep "RESYNC" from the ooemc log files. OOEMC will change node mode to 2 when it starts node resync. You should see something like the following from the log:

```
NOTICE: N17 <EMC_Node_c::InSync> SENDING RESYNC STATUS 2 FOR NODE 17 TO GUI - Node is synchronizing.
```

This message tells you that OOEMC will start node resync for node with ID equal to 17 (N17). If you look further in the log, you should see log messages related to SNMP request and SNMP response. If the SNMP request is successful, the switch will responds to the request. The OOEMC will then process the SNMP response by invoking response function which may do nothing:

```
<EMC_SnmpFunc_c::ProcFunc_GenNodeBulkFile_1> entering
```

If the log messages indicate SNMP error, refer to snmpcomm log files for more failure information.

2. Is the problem caused by bulk creation traps? What can I do?

You can grep "60901", "60902", and "60903" from the log files. See C.5.1.3 Node Mode Remains in 1 for more information. Anyway, you should see something like the following:

```
INFO: <EMC_TrapClientImpl::onIncomingTrap> NTS NodeId 17 genericTrap 6 specificTrap 60901
INFO: <EMC_TrapClientImpl::onIncomingTrap> NTS NodeId 17 genericTrap 6 specificTrap 60902
```

3. Is the problem is caused by config file FTP? What can I do?

You can get "FTP" or "to ftp" plus config upload file name. You should see something like:

```
NOTICE: N17 <EMC_NodeFsmHandler_c::LoadShelf> to ftp /opt/svplus/tmp/CARD_01_CC.CF.17
INFO: <ParseFile_c::CheckFile> OOEMC9 CHECKSUM OK FOR FTP FILE /opt/svplus/tmp/CARD_01_CC.CF.17
```

These messages indicate that FTP is successful and there is no checksum error in the file. Also from the log file, you should able to find out if there is FTP problem. Then you should refer to cwmftpd log files for more failure information.

4. Is the problem caused by shelf generic file or pnni file parsing? what can I do?

After you have located the starting pointing of checksum checking for shelf generic file (CARD_01_CC.CF.17 for example) or pnni file (PNNI_01_CC.CF.17 for example), continue to trace the log messages to see whether or not parsing error has occurred. If there is not error, you should see the following:

```
INFO: N17 <EMC_NodeFsmHandler_c::FinishShelf> Parse /opt/svplus/tmp/CARD_01_CC.CF.17 successfully.
```

Defect Information—Collect ooemc log files, nts log files, snmpcomm log files, and cwmftpd log files under /opt/svplus/log. Also collect config upload files in /opt/svplus/tmp

Possible alternative workaround—None

C.5.1.6 Cisco MGM DB Inconsistent With Switch Data After Successful Coldstart (Cisco MGM Server stop/start) or Periodic Resync

After successful node resync triggered by periodic resync, the Cisco MGM DB is found inconsistent with switch data.

Step 1 For this issues, what user can do is to collect ooemc log files and all config upload files for the node. OOEMC implement node based cache. User can dump and save the cache. First the user need to find out the process ID of the OOEMC process that manage the node by using the following commands:

The child ID is calculated from the following formula remainder (NEDBACCSSID / No. of OOEMC child) + 1

Save config upload files and ooemc log files.

Defect Information—Collect ooemc log files in /opt/svplus/log. Also collect all config upload files in /opt/svplus/tmp

Possible alternative workaround—User can manually resync the node. If the problem persists, user should try coldstart. If the problem is still not able to be resolved, collect log files and report the problem.

C.5.1.7 Cisco MGM CM GUI Shows Incomplete Connections After Successful Node Resync and Dbroker Sync Up

After EM node resync triggered by coldstart or periodic completes successfully and dbroker sync up also completes, the Cisco MGM CM GUI shows that some of connections are incomplete.

Step 1 For this issues, users have to determine which OOEMC process manages the node. OOEMC will manage the connection segment in Cisco MGM DB which terminates on the MGX. We have discussed in ISS: Node Mode Remains in 2 on how to find the child ID for the OOEMC process which manages your node. The purpose of finding the child ID of the OOEMC process is to find the correct OOEMC log files for inspection. The debugging process for this kind of issue mainly focuses on log files inspection.

Step 2 After you have identified the OOEMC log files, then grep "NotifyDataBroker" from the files to see some log message examples before you can modify your grep format to more efficiently grep the pair of log messages which corresponds to the local and remote ends of one end (master end point or slave end point) of a connection segment. In other words, each end (either master end or slave end) of a connection segment managed by OOEMC should be logged with one pair of messages: one for local end and one for remote end, and this pair of messages correspond to one atm_connection segment entry in DB for example. Now, you can verify the information that OOEMC sends to dbroker. DBROKER will base on these messages from OOEMC and constructs user_connection DB entry. Cisco MGM CM GUI will display connection with information from user_connection DB entry. Whether or not the connection will be displayed as complete or incomplete depends on the information in user_connection DB entry. Therefore, it is important to verify that OOEMC has sent correct information to DBROKER. Also verify that the segment DB entries are populated correctly.

Step 3 If you have made sure that correct number of messages have been forwarded to DBROKER and the data in the messages is correct, but the user_connection DB entry still contains invalid data, you should see C.15.2 Data Inconsistency for more debugging information, or contact DBROKER DE for further investigation. If the problem is due to wrong data populated in segment DB entries, then EM DE should look at the problem.

Defect Information—Collect ooemc log files and dbroker log files in /opt/svplus/log. Also collect config upload files in /opt/svplus/tmp

Possible alternative workaround—User can manually resync the node. If the problem persists, user should try coldstart. If the problem is still not able to be resolved, collect log files and report the problem.

C.5.1.8 Cisco MGM GUI Shows Mismatched Information Between GUI Views and DB Data

After OOEMC first time node resync such as coldstart, GUI views such as Network Monitor Tree View, Inspector View, Chassis View etc. display information which is not matched to newly provisioned or updated DB data. The problem persists even after each subsequent manual or periodic resync.

Step 1 For this issues, users have to determine which OOEMC process manages the node. We have discussed in ISS: Node Mode Remains in 2 on how to find the child ID for the OOEMC process which manages your node. The purpose of finding the child ID of the OOEMC process is to find the correct OOEMC log files for inspection. The debugging process for this issue mainly focuses on log files inspection.

Step 2 After first time node resync such as coldstart, OOEMC will start sending newly provisioned or updated DB data to NMServer. The current supported DB tables for NMServer message forwarding includes the following

- node
- card
- line
- ausm_port
- cesm_port
- frp
- rpm_port
- svc_port
- virtual_port
- aps
- ima_group
- ima_link
- linedistribution
- au4tug3
- controller
- license_in_use
- mfr_bundle
- mfr_link
- peripheral
- redundantcard
- sensor

Step 3 To determine whether or not OOEMC sends newly provisioned or updated DB data to NMServer, grep "ComposeNMSMsg" from OOEMC log files. The key words in log messages which correspond to the supported DB tables in "step 2" above are listed in the following:

- EMC_DBProperty_Node_c::ComposeNMSMsg
- EMC_DBProperty_Card_c::ComposeNMSMsg
- EMC_DBProperty_Line_c::ComposeNMSMsg
- EMC_DBProperty_AusmPort_c::ComposeNMSMsg
- EMC_DBProperty_CesmPort_c::ComposeNMSMsg
- EMC_DBProperty_FrPort_c::ComposeNMSMsg
- EMC_DBProperty_RpmPort_c::ComposeNMSMsg
- EMC_DBProperty_SvcPort_c::ComposeNMSMsg
- EMC_DBProperty_VtPort_c::ComposeNMSMsg
- EMC_DBProperty_Aps_c::ComposeNMSMsg
- EMC_DBProperty_ImaGroup_c::ComposeNMSMsg
- EMC_DBProperty_ImaLink_c::ComposeNMSMsg
- EMC_DBProperty_LineDist_c::ComposeNMSMsg
- EMC_DBProperty_AU4TUG3_c::ComposeNMSMsg
- EMC_DBProperty_Ctrlr_c::ComposeNMSMsg
- EMC_DBProperty_LicenseInUse_c::ComposeNMSMsg
- EMC_DBProperty_MfrBundle_c::ComposeNMSMsg
- EMC_DBProperty_MfrLink_c::ComposeNMSMsg
- EMC_DBProperty_Peripheral_c::ComposeNMSMsg
- EMC_DBProperty_RedCard_c::ComposeNMSMsg
- EMC_DBProperty_Sensor_c::ComposeNMSMsg

Step 4 Note that DB data will not be sent to NMServer during first time node resync such as coldstart. It is after first time resync that OOEMC starts sending updated or newly provisioned DB data to NMServer. Each OOEMC log message from grep will contain detail information for the identity of the NE object and the required fields from the corresponding DB table. The following is an example of NMServer message for line table:

```
ooemc10.24370.log.old.5:( 24370: 4) 23:15:17 INFO: N0:C7:B2:L2
<EMC_DBProperty_Line_c::ComposeNMSMsg> (MODIFY::LINE) aNMSEvent.node:0 type:4 subType:1
lpbkType:1 alarmState:1 adminState:1 sectStatus:6 pathState:2
```

In this example, the identity of the NE object is N0:C7:B2:L2 which is the line with node id = 0, slot = 7, bay = 2, and line# = 2. The DB operation is update. The rest of the message shows the values of the required fields from the line table.

Step 5 If grep returns log messages which indicate matched data, then you need to continue investigation on NMServer. See C.6.1 Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report Basics which describes the "nmController".

Defect Information—Collect ooemc and NMServer log files from /opt/svplus/log.

Possible alternative workaround—User can manually resync the node. If the problem persists, user should try coldstart. If the problem is still not able to be resolved, collect log files and report the problem.

C.5.2 Cisco MGM DB and Switch Data Inconsistency Issues After Node Provisioning for MGX

This section includes the following information:

- C.5.2.1 DB Table Population Through Traps and SNMP Upload
- C.5.2.2 Switch Data Does Not Match With Cisco MGM DB Table After Node Provisioning

C.5.2.1 DB Table Population Through Traps and SNMP Upload

Except for node and/or card resync, another mechanism that Cisco MGM OOEMC uses to populate the DB table entries is through trap processing and followed by snmp upload if necessary. User can provision the switch through switch CLI, Cisco MGM GUI or Cisco MGM service agents. All three cases will involve trap processing and snmp upload on OOEMC. Only connections can be provisioned by Cisco MGM CM GUI. Other provisioning such as line, port etc. have to go Cisco MGM service agents. Of cause, switch CLI can do both.

C.5.2.2 Switch Data Does Not Match With Cisco MGM DB Table After Node Provisioning

After switch provisioning through switch CLI, Cisco MGM GUI or Cisco MGM service agent, the switch data does not match to Cisco MGM DB.

Step 1 If the issue is caused by trap, for example, if user provisions a connection on a switch or through Cisco MGM GUI or service agent, and the Cisco MGM does not populate the DB entry or the information in the DB entry does not match with switch data, it is possible that the trap is not received by Cisco MGM. Or the trap is received by Cisco MGM, but it is buffered in the trap queues of OOEMC and the processing of the trap will be delayed. On the other hand, if the data in Cisco MGM DB is not correct, it is also possible that the SNMP upload fails to upload correct data. In any case, we need to study the log files and understand the root cause of the inconsistency problem.

Step 2 There are some key words in ooemc log files that you can grep and determine whether or not trap is received and processed. For example, to find out the channel traps from node_id=4, slot = 6, vpi = 1 and vci = 326, you can grep "TRAPLIST" as shown in the following:

```
cwmult60% grep "TRAPLIST: N4:" ooemc* | grep "Channel Trap" | grep "C6" | grep "vpi 1 vci
326"

ooemc10.5760.log.old.55:( 5760: 10) 23:21:12 INFO: TRAPLIST: N4: Channel Trap 60310 from
C6 B2 L1 P20 Ch299 ifIndex 17176597 vpi 1 vci 326 upCntr 0 vpcFlag 2 operS 1 alarm 67

ooemc10.5760.log.old.55:( 5760: 10) 23:21:12 INFO: TRAPLIST: N4: Channel Trap 60310 <
PROCESSED > from C6 B2 L1 P20 Ch299 ifIndex 17176597 vpi 1 vci 326 upCntr 0 vpcFlag 2
operS 1 alarm 67

ooemc10.5760.log.old.73:( 5760: 10) 23:23:48 INFO: TRAPLIST: N4: Channel Trap 60310 from
C6 B2 L1 P20 Ch299 ifIndex 17176597 vpi 1 vci 326 upCntr 0 vpcFlag 2 operS 1 alarm 66
```

For other kinds of traps, you can use the following key words to supplement "TRAPLIST" in your grep statement:

1. Port Trap
2. RscPart Trap
3. Svc Trap
4. SonetLn Trap
5. SctCard Trap
6. SonetPath Trap
7. FunMod Trap
8. LineMod Trap
9. RedCard Trap
10. TrapMiss Trap
11. VsiCtrlr Trap
12. DS3Line Trap
13. AtmPhy Trap
14. Peripheral Trap
15. CoreSwth Trap
16. TrapLost Trap
17. AtmAddr Trap
18. Restart Trap
19. Node Trap
20. SonetAps Trap
21. LMIPort Trap
22. Pnni IF Trap
23. Bulkfile Trap
24. Vism Trap
25. Vism Ann Trap
26. SubIf Trap
27. NBSMCnfg Trap
28. NBSMChan Trap
29. NBSMLine Trap
30. AusmLine Trap
31. AusmPort Trap
32. AusmChan Trap
33. AusmIma Trap
34. FrChan Trap
35. FrPort Trap
36. CesmPort Trap

37. CesmChan Trap
38. HsFrPort Trap
39. HsFrChan Trap
40. LineDist Trap
41. DS3Path Trap
42. Chan Upload
43. Party Trap
44. PrefRoute Trap
45. CardIma Trap
46. DS1 Line Trap
47. SctPort Trap
48. SvcDerouteGroomTrap
49. Channel Trap
50. TUG3Path Trap
51. Cug Trap
52. AddrCug Trap
53. RSC Upload
54. APS Upload
55. FrPort State Upload
56. MPSM Upload
57. Vism ToneDetect Trap
58. License Trap
59. PortAtmIf Trap
60. VxsmPvcRed Trap
61. ChanProt Trap
62. VxsmGwDsp Trap
63. VxsmGwIp Trap
64. VxsmGw Trap
65. VxsmSysRes Trap
66. VxsmGw1 Trap
67. VxsmMgc Trap
68. VxsmMgcIp trap
69. VxsmMgcGrpParam Trap
70. VxsmMgcGrpMgc Trap
71. VxsmMgcGrpProt Trap
72. VxsmAal2Prof Trap
73. VxsmCodec Trap
74. VxsmSvc Trap

75. VxsmAal2CrossConn Trap
76. VxsmAal25DataProfileTrap
77. VxsmSensor Trap
78. VxsmSensorThrhd Trap
79. VxsmModule Trap
80. DS0Grp Trap
81. VxsmAnnounce Trap
82. VxsmAudioFile Trap
83. VxsmDs0XConn Trap
84. VxsmMegaco Trap
85. VxsmCrr Trap
86. VxsmTone Trap
87. VxsmAs Trap
88. VxsmAsp Trap
89. VxsmAs Trap
90. VxsmLapd Trap
91. VismABCDBitTemplate Trap

Of cause, you may need to study the log messages with "TRAPLIST" and decide how you can grep the messages for your need. In the above example, there is another key word "PROCESSED" which indicates that the trap has been processed. This gives you the starting point in the log file so that you can study the log messages. if the DB is not populate correctly, then the subsequent log messages in the log messages should provide you information on DB inconsistency problem. Some trap processing may invoke SNMP data upload. From the log messages, you can verify whether or uploaded data is correct. Other possible reasons for DB inconsistency are:

1. SNMP upload failure and maximum retrials exceeded, SNMP timeout, or throttle error. You can verify the problem in snmpcomm log files
2. DB operation error. You can verify the problem in ooemc log files

If you do not know exactly what traps sequence is sent by switch to Cisco MGM, you should try a working scenario and study the log for the trap sequence, or you can use HPOV to determine the trap sequence.

Step 3 The previous step takes care of the cases that trap has been received and processed. The grep in the previous step also allow you to find out whether traps have been received and has been buffered in the trap queues, or related traps are not received at all. For the latter case, you need to refer to NTS logs to verify whether traps have been received by NTS from switch and forwarded by NTS to OOEMC. If the trap has been buffered in trap queue, the possible reasons are:

1. Node is syncing due to regular node resync or due to -2 trap.
2. Card is syncing and the trap is related to the card. The traps will buffered in queue until card resync completes.
3. Summary alarm trap is processed. Summary alarm is being uploaded or parsed. You can grep the log files for information related to summary alarm traps

To verify that the trap has been put into queue, you can do the following

```
grep EMC_TrapQueue_c::append ooemc_log | grep trap_num
```

You should see something like the following:

```
INFO: <EMC_TrapQueue_c::append> entering. ======> append trap# 60303 to trap queue;
getHdlrLevel=5, getTrapLevel=5, #=174
```

Defect Information—Collect ooemc log files, nts log file, and snmpcomm log files under /opt/svplus/log.

Possible alternative workaround—User can manually resync the node. If the problem persists, user should try coldstart. If the problem is still not able to be resolved, collect log files and report the problem.

C.6 Configuration Center, Chassis View, Diagnostic Center and Statistics Report Problems

This section includes the following information:

- C.6.1 Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report Basics
- C.6.2 Basic Issues
- C.6.3 Topology Discovery Issues
- C.6.4 Network Element Discovery Issues
- C.6.5 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Alarm Issues

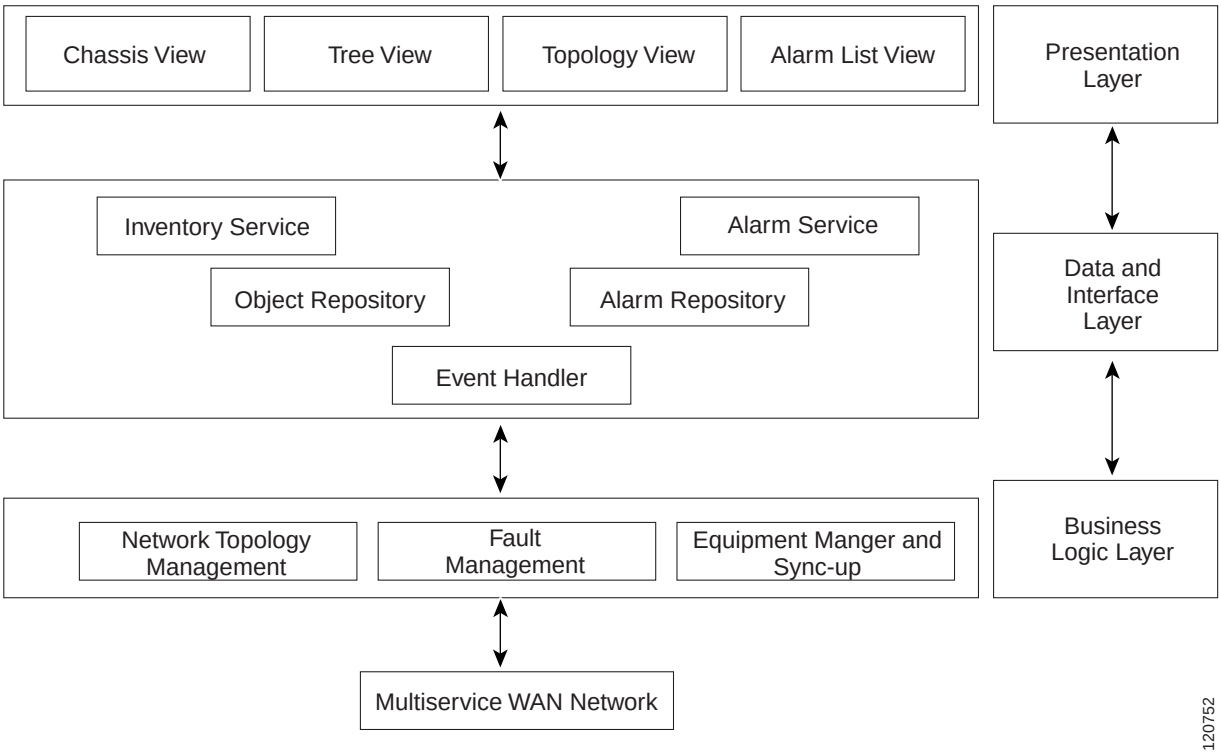
C.6.1 Cisco MGM Configuration Center, Chassis View, Diagnostic Center or Statistics Report Basics

Cisco MGM manages MGX NEs. The Topology module discovers the nodes and trunks. Once the nodes are discovered, the EM module syncs up with the nodes to discover the card, line, port, etc. All the discovered nodes, trunks and its elements are published by NMServer, which in-turn are displayed in the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs. The Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs have Tree View, Inspector View. The Tree View and Inspector View are shared by Configuration Center, Diagnostic Center, Finder, Statistics Report and Chassis View GUIs. The Tree View and InspectorView feed-off the data published by NMserver.

Cisco MGM is notified of all subsequent changes in the network through traps.

Figure C-1 shows the end-to-end architecture.

Figure C-1 Cisco MGM End-to-End Architecture



NMServer provides Inventory and alarm information for Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs. The node information is pushed by topod to NMServer. The initial inventory of card, lines, ports, etc., is read from the database. The dynamic updates are pushed to NMServer from topod, ooemc and sdbroker.

There are two utilities under /opt/svplus/util/ directory which are shipped with Cisco MGM to debug issues in NMServer:

- nmControl—This utility provides means to check the NMServer cache and its state. It allows the following operations. Output is redirected to /opt/svplus/log/nmControl.log. Cache dumps are redirected to /opt/svplus/log/nmControl.dump. All the listed operation are non-destructive and they perform the tasks in a passive mode. Do not use Option 2 (to dump all the cache_ for a large network which has more than 1000 nodes.

  MGM% nmControl:

  – Resync Node—Resyncs the node (specified by the node_id).
  – All Cache—Dumps all the data in its cache to the dump file.
  – Topology Cache—Dumps Topology (node) data to the dump file.
  – Node Cache—Dumps a node's data (specified by node_id) to the dump file.
  – MGM Alarm Cache—Dumps the Cisco MGM specific alarms to the dump file.
  – ClientManager Cache—Dumps the information about all the Clients to the dump file.
  – Error Statistics—Dumps the error information associated with the sync-up to the dump file
  – Syncup Status—Dumps the sync-up state to the dump file
  – Configuration—Dumps the Configuration data to the dump file

- nmClient—This utility is used to isolate an issue between client and server. It is used to query the NMServer the same way as the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI queries the Server. It allows the following operations. Output is redirected to /opt/svplus/log/nmClient.log. Cache dumps are redirected to /opt/svplus/log/nmClient.dump.

  The user has to first register with the Server (Option 1), before performing other operations. Like-wise, when the user is done using the client, unregister the Client (Option 3).

  MGM% nmClient:

  – Register Client—Registers with the Server
  – Update Filter—Updates the subscription/filter with the server passing the FDN
  – Unregister Client—Unregisters with the Server
  – Get Topology—Get the Topology Information of Networks and Nodes
  – Get Children—Get the list of children for a particular object in the tree.
  – Get CwmInfo—Get the Cisco MGM sync-up state information
  – Get ManagedObject—Get the detailed information about an object in the tree.
  – Subscribe for all events—Subscribe for all updates from the Server
  – Unsubscribe for all event—Unsubscribe for all updates from the Server

The GUI Client's log files (CMSCclient.log) are saved under log dir in the user's home directory. For example, in Windows, D:Documents and Settings\<userId>\log\, or in Unix: /opt/svplus/log

C.6.2 Basic Issues

This section includes the following information:

- C.6.2.1 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show Any Nodes
- C.6.2.2 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Are Unable to Connect to Server
- C.6.2.3 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Newly Added Node

C.6.2.1 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show Any Nodes

No nodes show in the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the nodes are discovered. See C.4.2.1 No Nodes Are Discovered.

Step 2 Check whether NMServer has the nodes and trunks in its cache. This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 3 If the node(s) are in NMServer cache, open a new GUI and verify whether the node(s) are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log

Possible alternative workaround—Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.

C.6.2.2 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Are Unable to Connect to Server

Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI is unable to connect to Server.

Step 1 Check whether the client registers in NMServer.log.

Step 2 Enable orbix logs by creating orbix dir in /opt/svplus/log/ dir.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log, NMServer.log
- Collect Orbix logs for NMServer.

Possible alternative workaround—None.

C.6.2.3 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Newly Added Node

A newly added node is not shown in the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the nodes are discovered. See C.4.2.1 No Nodes Are Discovered.

Step 2 Check whether NMServer has the nodes in it's cache.

This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 3 If the node(s) are in NMServer cache, Open a New GUI and verify whether the node(s) are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log

Possible alternative workaround—Open a new GUI.

C.6.3 Topology Discovery Issues

This section includes the following information:

- C.6.3.1 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Node
- C.6.3.2 Node Information Incorrect on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs
- C.6.3.3 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows a Node That Is Not in the Network
- C.6.3.4 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows Incorrect SyncState for a Node
- C.6.3.4 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows Incorrect SyncState for a Node
- C.6.3.5 Duplicate Nodes Are Displayed on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

C.6.3.1 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Node

A node is not shown in the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the nodes are discovered. See C.4.2.1 No Nodes Are Discovered.

Step 2 Check whether NMServer has the nodes in it's cache.

This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 3 If the node/trunk(s) are in NMServer cache, Open a New GUI and verify whether the node are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log

Possible alternative workaround—Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

C.6.3.2 Node Information Incorrect on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

The node information like node name, IP Address, alarm state, etc., of a node shows incorrectly on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check the node information in database using selnd command.

Step 2 Check the node information in NMServer's cache.

This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 3 Check the CMSCclient.log for the node information.

Step 4 Using nmClient, use getTopology option to retrieve the node information and verify whether it matches with database and the GUI.

Step 5 If the node information is correct in NMServer cache, Open a New GUI and verify whether the node is shown correctly in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect selnd o/p
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log

Possible alternative workaround—Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.

C.6.3.3 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows a Node That Is Not in the Network

The Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI shows a node that is not part of the network anymore.

Step 1 Check the node information in database by querying the node, packet_line table. Verify whether the node is active.

Step 2 If the node is active, see C.4.2.1 No Nodes Are Discovered.

Step 3 Check the node in NMServer's cache.

This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 4 Check the CMSCclient.log for the node/trunk.

Verify whether a delete message was received for the node.

Step 5 Using nmClient, use getTopology option to retrieve the node information and verify whether it matches with database and the GUI.

Step 6 If the node is not present in NMServer cache, Open a New GUI and verify whether the node is shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect the ILMITopoc.log, topod.log, NMServer.log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.6.3.4 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows Incorrect SyncState for a Node

The Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI shows incorrect SyncState for a node.

Step 1 Check the node information in database by querying the node table.

This can be done by using the command selnd on the Cisco MGM CLI. Check the status

Step 2 Check the node in NMServer's cache.

This can be done by using the command nmControl (Option 3) on the Cisco MGM CLI.

Step 3 Check the CMSCclient.log for the node.

Verify whether the correct message was received for the node.

Step 4 Using nmClient, use getTopology option to retrieve the node information and verify whether it matches with database and the GUI.

Defect Information—Collect the following information for further analysis:

- Collect the ILMITopoc.log, topod.log, NMServer.log
- Collect the dump outputs of ILMITopoc, topod and NMServer. The dump can be captured by issuing a kill -USR1 signal to the process.
- Collect the output of the switch CLI, selnd and dbnds.

Possible alternative workaround—None

C.6.3.5 Duplicate Nodes Are Displayed on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

Duplicate Nodes Displayed on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether node table has duplicate node id.

The node table can be queried using the below command.

tballraker18% echo "select * from node where node_id=2 and slot=1" | dbaccess stratacom

Step 2 Check whether both nodes in database have active =1. If only both are active then collect the logs.

Step 3 If duplicate nodes do not exist in database, then check the cache of NMServer using nmControl (Option 3).

Step 4 Check the CMSCclient.log for the node.

Step 5 Using nmClient, use getTopology option to retrieve the node information and verify whether it matches with database and the GUI.

Step 6 If duplicate nodes is not present in NMServer cache, Open a New GUI and verify whether the node is shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under /opt/svplus/log. For PC Client, collect CMSCclient.log file under D:\Documents and Settings\<username>\log.
- Collect node data from node table for that specific node.
- Collect ILMITopoc.log, topod.log need to be collected if there are duplicate nodes in database.

Possible alternative workaround—None

C.6.4 Network Element Discovery Issues

This section includes the following information:

- C.6.4.1 All the Cards Under a Node Are Missing
- C.6.4.2 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Card/Line/Port for a Node
- C.6.4.3 Card/Line/Port Information Incorrect on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs
- C.6.4.4 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows a Card/Line/Port That Is Not Present in a Node

C.6.4.1 All the Cards Under a Node Are Missing

No Cards are shown under a node in the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the node is synced up.

This can be done by using the command selnd on the Cisco MGM CLI.

Step 2 If the node has not synced up, then wait for the node to sync-up.

Step 3 If the node has synced up, then check whether cards are populated in the card table. If the Card table is empty, Collect the EM logs. See C.5 Equipment Management Problems.

Step 4 Check whether NMServer has cards in it's cache.

This can be done by using the command nmControl (Option 4) on the Cisco MGM CLI.

Step 5 If cards are not present in NMServer cache, collect the logs.

Step 6 If cards are present in NMServer cache, use nmClient and verify whether getChildren for node's FDN, returns the cards in the nmClient.<pid>.dump file.

Step 7 If cards are present in NMServer cache, Open a New GUI and verify whether the cards are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 4.
- Collect CMSCclient.log

Possible alternative workarounds:

1. Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.
2. Use nmControl and perform "Resync Node" specifying the node id.

C.6.4.2 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs Do Not Show a Card/Line/Port for a Node

A card/line/port etc. for a node is not shown the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the node is synced up.

This can be done by using the command selnd on the Cisco MGM CLI.

Step 2 If the node has not synced up, then wait for the node to sync-up.

Step 3 If the node has synced up partially, check whether card/line/port are populated in the database. Refer to the DB Schema Doc.

Step 4 If the entry is not populated in the database, see C.5 Equipment Management Problems.

Step 5 If entry is present in the database, check the NMServer cache.

This can be done by using the command nmControl (Option 4) on the Cisco MGM CLI. Check the nmControl.<pid>.dump

Step 6 If element is present in NMServer cache, use nmClient and verify whether getChildren for FDN, returns the entities in the nmClient.<pid>.dump file.

Step 7 If element is present in NMServer cache, Open a New GUI and verify whether the missing elements are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 4.
- Collect CMSCclient.log

Possible alternative workarounds:

1. Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.
2. Use nmControl and perform "Resync Node" specifying the node id.

C.6.4.3 Card/Line/Port Information Incorrect on Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs

The entity information like type, alarm state, etc., of an element shows incorrectly on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUIs.

Step 1 Check whether the node is synced up.

This can be done by using the command selnd on the Cisco MGM CLI.

Step 2 If the node has not synced up, then wait for the node to sync-up.

Step 3 Check whether card/line/port are populated in the database. Refer to the DB Schema Doc.

Step 4 If the entry in the database matches the GUI, see C.5 Equipment Management Problems.

Step 5 If entry doesn't match with the database, check the NMServer cache.

This can be done by using the command nmControl (Option 4) on the Cisco MGM CLI. Check the nmControl.<pid>.dump

Step 6 Use nmClient and verify whether getChildren for FDN, returns the correct information for the element in the nmClient.<pid>.dump file.

Step 7 If element is present in NMServer cache, Open a New GUI and verify whether the missing elements are shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 4.
- Collect CMSCclient.log

Possible alternative workarounds:

1. Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.
2. Use nmControl and perform "Resync Node" specifying the node id.

C.6.4.4 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Shows a Card/Line/Port That Is Not Present in a Node

The extra card/line/port etc. element is shown incorrectly on the Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.

Step 1 Check whether the node is synced up.

This can be done by using the command selnd on the Cisco MGM CLI.

Step 2 If the node has not synced up, then wait for the node to sync-up.

Step 3 Check whether card/line/port are populated in the database. Refer to the DB Schema Doc.

Step 4 If the element is present in the database matches the GUI, see C.5 Equipment Management Problems.

Step 5 If element is not in the database, check the NMServer cache.

This can be done by using the command nmControl (Option 4) on the Cisco MGM CLI. Check the nmControl.<pid>.dump

Step 6 Use nmClient and verify whether getChildren for FDN, returns the element in the nmClient.<pid>.dump file.

Step 7 If element is not present in NMServer cache, Open a New GUI and verify whether the extra element is shown in the new GUI.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, ILMITopoc.log, NMServer.log
- Collect nmControl.dump for option 4.
- Collect CMSCclient.log

Possible alternative workarounds

1. Open a new GUI and a new Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI.
2. Use nmControl and perform "Resync Node" specifying the node id.

C.6.5 Configuration Center, Chassis View, Diagnostic Center or Statistics Report GUI Alarm Issues

This section includes the following information:

- C.6.5.1 Alarm Processing Basics
- C.6.5.2 XML Schema for Alarm Rules
- C.6.5.3 Alarm Severity and Object Severity
- C.6.5.4 Severity Shown on Tree View Does Not Match Severity Shown on Platform
- C.6.5.5 Alarm List Shows Alarm That Does not Exist on Platform
- C.6.5.6 Transient Event Has Disappeared Unexpectedly
- C.6.5.7 Port in Tree View Displays an Aggregate Alarm, However No Children Exist Under Port

C.6.5.1 Alarm Processing Basics

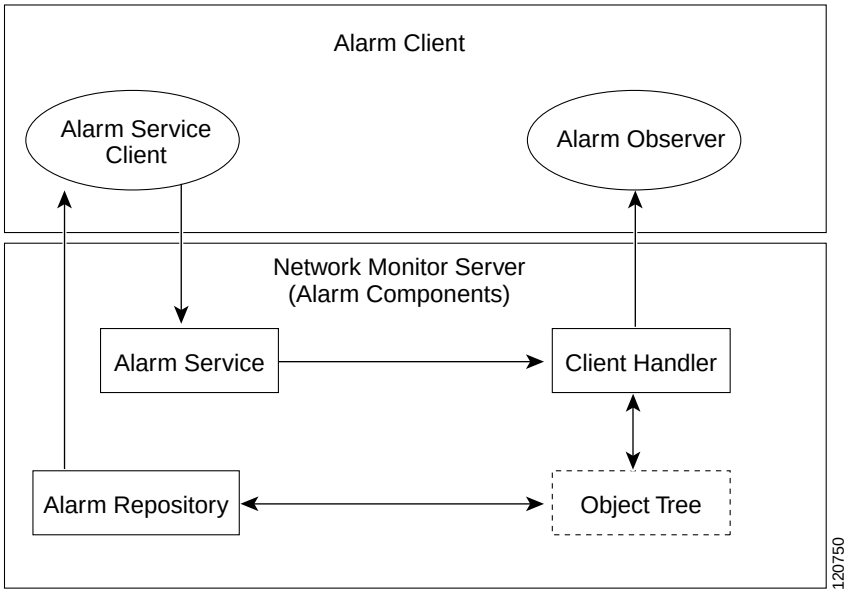
Alarm processing is done within the NMServer processes. Following are some vital points with regard to alarm processing:

1. Alarm rules are defined in an XML file (/opt/svplus/xml/ruledata.xml). For details on 'XML schema on alarm rules, see Figure C-2.
2. GUI clients register for alarms by providing the parent FDN
3. GUI clients pull initial alarms from NMServer. After initial pull of alarms, all alarms are pushed to registered clients by NMServer when alarms occur
4. Object severity for any and all network elements is determined by the XML alarm rule
5. Administrative states of network element states are not displayed in alarm list, only alarm states.

6. Alarm List displays mostly active alarms, however some 'Events' are also displayed. For details on 'Events vs. Alarms' see Figure 7.5.2, "INF: XML Schema for alarm rules," on page 153.
7. Some alarms result in the network element having a different alarm severity then the actual alarm. For details on 'Object Severity vs. Alarm Severity' see Figure 7.5.3, "INF: Alarm Severity vs. Object Severity," on page 156.

Alarms for various network elements are stored in memory cache in the NMServer Object Tree. GUI clients register for alarms from NMServer by providing the FDN of the network element for which they would like alarms for. All alarms for network elements under the FDN registered will be send if the parent FDN is registered. GUI clients may also update alarms, such as flag an alarm as acknowledged, or manually clear an alarm. These updates are done via the 'Alarm Repository' component of NMServer. Figure C-2 illustrates the client/server architecture for alarm components in NMServer.

Figure C-2 Client/Server Architecture for Alarm Components



C.6.5.2 XML Schema for Alarm Rules

Alarm rules are defined in XML, specifically a file named $HOME/xml/ruledata.xml. These alarm rules are read once when NMServer starts. When events are processed, the rules are queried from memory to determine what action with regard to alarms, should be taken on the event. There are 3 types of alarm rules defined in the XML schema: Correlated, Correlated Bitmap, and Transient. Specifics on each of these three types follows.

1. Correlated Alarm Rule Type

The correlated alarm rule type is the most common in ruledata.xml. This rule is used when a network element can only be in one of many states at any one time. If the entity were to change states, then the previous alarm state would be cleared. Most network elements managed by Cisco MGM fall into this category. A simple example is DB SyncUp status of a node. The syncup status can be one of 'Partial Syncup', 'Syncup Failed', or 'In Sync'. Any one of these states correlates out any other. See Figure C-3.

Figure C-3 Correlated Alarm Rule Diagram

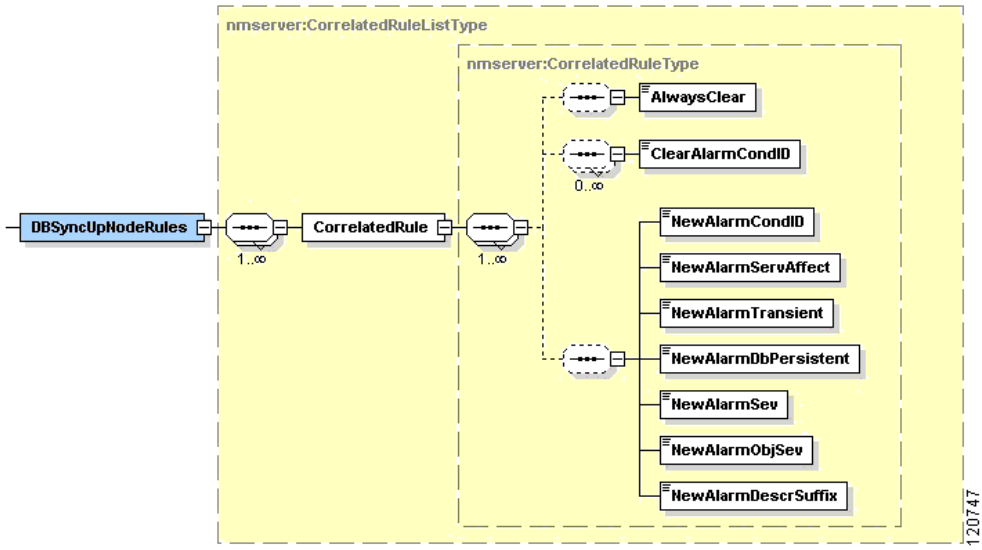


Figure C-3 XML annotation can be read as follows. A CorrelatedRule can have any of the following:

- 1 AlwaysClear (Used when a given element never has an alarm, such as top level Network)
- 0 or more ClearAlarmCondIds
- 1 New Alarm (which consists of NewAlarmConditionID, NewAlarmServAffect, etc.)

2. Correlated Bitmap Alarm Rule Type

The Correlate Bitmap alarm rule type is different then the correlated alarm rule type because the bitmap rule type can represent many states an entity can be in at any one particular time. The correlated bitmap rule type is used primarily to represent line alarms. Lines can have many different alarms associated with them at any given time, such as 'Loss of Signal', and 'Loss of Frame'. See Figure C-4.

Figure C-4 Correlated Bitmap Alarm Rule Diagram

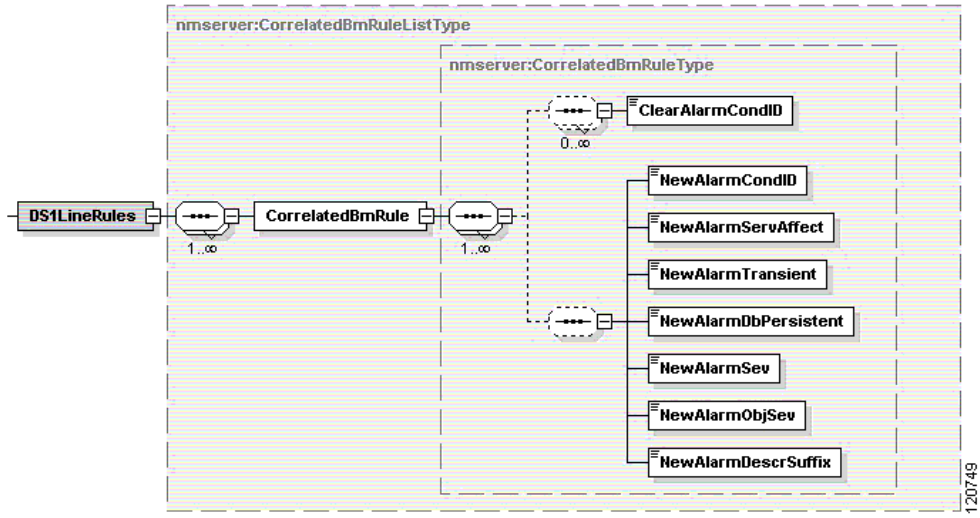


Figure C-4 XML annotation can be read as follows. A CorrelatedBmRule can have any of the following:

- 0 or more ClearAlarmCondIds
- 1 New Alarm (which consists of NewAlarmConditionID, NewAlarmServAffect, etc.)

3. Transient Alarm Rule Type

The Transient Alarm rule type is used to distinguish events vs. alarms. Alarm List does show some events. Events are normally associated with the NMS itself. Examples of events are 'Process restarted' or 'Primary Gateway disconnected'. These are NMS events that are not correlated, but are displayed in the alarm list. Another example of a transient event that is not related to the NMS is a card switchover. If APS is enabled on a card and there is an APS switchover, an event will be displayed in the alarm list. The primary distinction between 'Transient' Events and 'Correlated' Alarms is Transient events are not cleared by the network, whereas correlated alarms are. See Figure C-5.

Figure C-5 Transient Alarm Rule Diagram

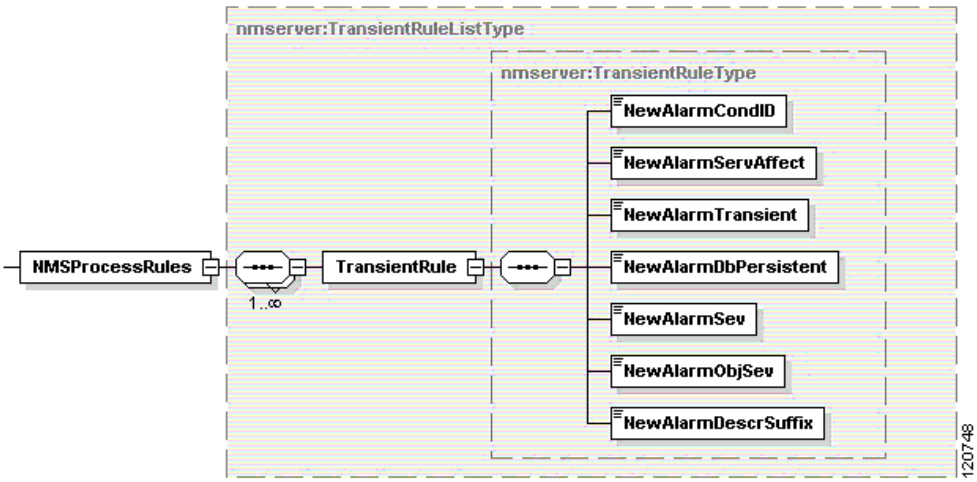


Figure C-5 XML annotation can be read as follows. A Transient can only one a New Alarm associated with it. Note, there are no 'ClearAlarmCondID' associated with a Transient rule. Transient alarms are either manually cleared by the user, cleared by the same transient alarm occurring twice, or purged by NMServer when a high threshold is hit.

C.6.5.3 Alarm Severity and Object Severity

There are two severities assigned to every alarm in alarm rules XML file. The two severities are called 'Object' and 'Alarm' severity. These severities do match for most alarms. There are some cases however, where these severities are different. Below is an example of XML alarm rule where object and alarm severity do not match:

```
<CorrelatedRule State="1 -1">
<ClearAlarmCondID>10302</ClearAlarmCondID>
<ClearAlarmCondID>10303</ClearAlarmCondID>
<ClearAlarmCondID>10304</ClearAlarmCondID>
<NewAlarmCondID>10301</NewAlarmCondID>
<NewAlarmServAffect>0</NewAlarmServAffect>
<NewAlarmTransient>0</NewAlarmTransient>
<NewAlarmDbPersistent>0</NewAlarmDbPersistent>
```

```
<NewAlarmSev>6</NewAlarmSev>
<NewAlarmObjSev>7</NewAlarmObjSev>
<NewAlarmDescrSuffix>Sync-Up has not started yet</NewAlarmDescrSuffix>
</CorrelatedRule>
```

This alarm will occur if the southbound processes (EMs) send a node message with EM syncup status as 1 or -1. If that does occur, then the node should be unreachable severity (value 7) in the tree view. Note there is no 'unreachable' severity in the alarm list. This is why we have two severities for each alarm. There is no such alarm severity as 'unreachable' in the alarm list. Unreachable alarms have 'Critical' (value 6) severity in the alarm list.

Another instance when 'Alarm' and 'Object' severity do not match is for 'Aggregate Port' alarms. Aggregate port alarms are alarms that summarize the condition of the connections on the port. Since these alarms should not effect the severity of the port, the object severity of these is alarms is 'Clear' (value 3). Following is the XML for an aggregate port alarm:

```
<CorrelatedBmRule StateBm="1">
<NewAlarmCondID>40801</NewAlarmCondID>
<NewAlarmServAffect>0</NewAlarmServAffect>
<NewAlarmTransient>0</NewAlarmTransient>
<NewAlarmDbPersistent>1</NewAlarmDbPersistent>
<NewAlarmSev>5</NewAlarmSev>
<NewAlarmObjSev>3</NewAlarmObjSev>
<NewAlarmDescrSuffix>Aggregate Port alarm, One or more connections on this port are in
primary failure</NewAlarmDescrSuffix>
</CorrelatedBmRule>
```

Note the alarm severity ('NewAlarmSev' tag) is 'Major' (value 5).

C.6.5.4 Severity Shown on Tree View Does Not Match Severity Shown on Platform

Severity of network element in tree view does not match the severity the switch is showing for the same network element.

Step 1 Verify customer is comparing the correct severity icon

- **a.** There are two severities associated with every object in the tree view, the Aggregate severity and the Self severity. The aggregate severity is on the left, the Self severity is on the right. Since the switch does aggregation of many faults, the customer should compare the aggregate severity of the object in tree view with the severity of the switch.
- **b.** If the customer is looking at the correct severity icon and there is still a discrepancy between the severities, continue to Step 2.

Step 2 Verify whether Cisco MGM has synced up with the node.

- **a.** Login to Cisco MGM server and type 'selnd'
- **b.** Verify the mode of the node in question is 3

Step 3 If the mode is 3, continue to Step 4.

Step 4 Verify whether discrepancy is caused by aggregated connection alarms

a. NMServer does more aggregation of alarms then the platform. For instance, NMServer aggregates connection alarms up the port and the switch does not. Therefore, if the tree view displays a higher severity then the switch, it maybe caused by one or more aggregated port alarms.

b. Right click the NE (network element) in the tree view and choose 'show alarms'. All of the alarms for this NE and its children should display in the alarm list.

c. Filter on the alarms that are greater severity then what the platform is showing

d. Are these alarms 'Aggregate Port' alarms? If so, this is expected behavior and there is no defect. If there are alarms that are greater severity then what is shown on the platform, and they are not 'Aggregate Port' alarms, continue to next step to troubleshoot whether the alarm is in DB.

Step 5 Verify whether DB has correct alarm state. Refer to the DB schema document for information on what table to lookup for this particular entity type.

Defect Information—Collect the following information for further analysis:

- Collect NMServer.log
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log on client machine.

Possible alternative workaround—Open a new GUI and a new Cisco MGM MGXNE Specific GUI (CC,DC,CV,SRT)

C.6.5.5 Alarm List Shows Alarm That Does not Exist on Platform

There are several alarms that are correlated by NMServer and are not handled by the switch. This is the case because the NMS keeps track of alarm conditions that may not be relevant to the switch alone, but are relevant to the switch + the NMS. One example of such an alarm is the node syncup state. The switch itself is not interested in the fact that the NMS may not be synced up with it, but the NMS is interested in this information. Therefore if the node is still syncing up with the NMS, an alarm will be displayed for this node in Alarm List, but there will not be such an alarm on the platform. Below is a summary of alarms that may be seen in the Alarm List, but not seen on the platform.

Step 1 If there exists an alarm in the alarm list, and not on the platform, check if the suspect alarm is included in the following list:

1. Node Syncup status alarms
2. Node DB Syncup status alarms
3. Node Management State status alarms
4. Node Aggregate alarm status
5. Link0/Link1 Node alarms
6. Card Syncup status alarms
7. Aggregate Port (Connection) alarms

Step 2 If the suspect alarm is not in the list above, and it is displayed in the alarm list and not on the platform, it may be defect. See below for troubleshooting further

a. Verify whether DB has correct alarm state, refer to the DB schema document for information on what table to lookup for this particular entity type.

b. Collect the information requested in Defect information section.

Defect Information—Collect the following information for further analysis:

- Collect topod.log, linktopoc.log, ILMITopoc.log, NMServer.log, fileTopoc.log
- Collect nmControl.dump for option 3.
- Collect CMSCclient.log

Possible alternative workaround—Open a new GUI and a new Cisco MGM MGXNE Specific GUI (CC,DC,CV,SRT)

C.6.5.6 Transient Event Has Disappeared Unexpectedly

Transient alarms behave somewhat differently depending on whether the entity is managed network element, or the NMS itself. If the transient alarm is on a managed network element, such as a 'FTP transfer failed', then the alarm is self-clearing. This means if the same transient alarm happens twice or more, the previous active alarm is cleared by the latest.

If the transient alarm is not a managed network element, but rather the NMS itself, then the alarm is not self-clearing and there will be multiple of the same alarm conditions. Since these NMS alarms (or Events) that pertain the NMS, are not cleared by the NMS, NMS alarms are not correlated. They must be cleared manually by the operator. If these events are not manually cleared, the list will grow only to the value of MAX_ACTIVE_NMS_EVENTS that is specified in the NMServer.conf file. Once the list of NMS alarms reaches MAX_ACTIVE_-NMS_EVENTS, NMServer will automatically clear the oldest alarms in the list to make room for the new events. The number of events that will be cleared each time the max is reached is also specified in NMServer.conf. That configuration parameter is called EVENTS_TO_CLEAR_WHEN_MAX_REACHED.

If there was a transient event that has unexpectedly disappeared, it is most likely because NMServer is purged the event. Follow these steps below to investigate the issue.

Step 1 Filter the alarm list on Cisco MGM alarms

Step 2 Check the alarm count and compare it with the MAX_ACTIVE_NMS_EVENTS value in NMserver.conf. If the alarm count is close to the MAX_ACTIVE_NMS_EVENTS, then this explains why the transient event has been purged.

Step 3 If the alarm count for NMS alarms is nowhere near the MAX_ACTIVE_NMS_EVENTS the missing event may have been manually cleared. The NMServer log will indicate whether the event was manually cleared.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log, NMServer.log, CMSCclient.log
- Capture NMServer dump, option 3 in nmControl.

Possible alternative workaround—Restart Alarm List GUI.

C.6.5.7 Port in Tree View Displays an Aggregate Alarm, However No Children Exist Under Port

The tree view in Cisco MGM client GUIs display network elements from the top-level 'Physical View' down to the 'Port'. Alarm severities are aggregated from children up to parents. Since the port is at the lowest level of the tree, the question often arises as to how a port can have an aggregate alarm if it has no children? The answer to this question is simply: Connections are 'virtual' entities under ports in the tree view. Virtual, in the fact that the user will not see connections in the tree. But connection alarms are aggregate up to the port in the tree view.

If the customer sees an aggregate port alarm, but the customer believes there are no connections in alarm under the port, follow these steps to troubleshoot the issue.

Step 1 In general, the customer needs to compare the connection alarms with the aggregate port alarms. Follow these steps to accomplish this

a. In the Configuration Center GUI, click the 'Connections' tab at the top.

b. Find the port in the tree view and drag and drop it to the right window pane.

c. The Connection view window should launch.

d. Click the 'Get' button on the bottom of the frame.

e. The connections should be listed, and the alarm status should match alarm status in Alarm List.

Step 2 If the connection alarms do not match the aggregate port alarm(s) in Alarm List GUI, there may be a defect. Collect the defect information.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log, NMServer.log, sdbroker*.log, xdbroker*.log
- Capture NMServer dump, option 3 in nmControl.

Possible alternative workaround—none

C.7 Chassis View Problems

This section includes the following information:

- C.7.1 Chassis View Basics
- C.7.2 Lines Not Displayed in MGX Nodes
- C.7.3 Card Not Displayed in MGX Nodes
- C.7.4 DCA/DCB Status Not Displayed in PXM Cards
- C.7.5 Ethernet Status Not Updated in PXM Cards
- C.7.6 HIST, CBRX, CBTX Status Not Updated in MGX Nodes
- C.7.7 RPM Card Status not Updated
- C.7.8 RPM Secondary Card Status Is Blue
- C.7.9 Lines Not Displayed in Secondary Card
- C.7.10 Lines Not Selectable
- C.7.11 Wrong Tooltip Is Displayed

C.7.1 Chassis View Basics

Chassis View is a read-only application which provides the physical view of WAN devices. For a specific node, it displays node, cards and lines. Chassis View does not display port.

Chassis View can handle the following events

- Node status changes
- Card status changes
- Line status changes

The Alarms handled by Chassis View are:

- Card alarm
- Line alarm

Chassis View shows an empty slot in the chassis when displaying un-supported cards. For Reserved Card, it shows the lines, but they are un-manageable (will not be selectable). Chassis View does not show lines under card when the card is in the any other state, other than active or stand-by.

Chassis View displays the Chassis by combining static data from the XML file and dynamic data from the Database. The first step in debugging is to check if data is populated properly in the Database. The next step would be to check that the card or line is defined in the XML file.

C.7.2 Lines Not Displayed in MGX Nodes

Lines are not displayed in the Chassis View in MGX node.

Step 1 Check if data about the lines are populated for the corresponding lines in the line table in the database.

Step 2 Check whether the lines are defined in the XML file Chassis View.xml.

Step 3 Make sure that the line numbers in the DB start from 1 and not from 2 or above.

Step 4 Make sure that the node is in sync (mode is 3).

Defect Information

If the details are not found in the DB, this probably is an EM issue. If the details are found, then proceed as follows:

Step 5 Use cwmver to get the Cisco MGM version.

Step 6 Get the node table information for the node using echo "select * from node where node_id=<NodeId> " | dbaccess " and save it in a file.

Step 7 Get the card table information for the card using echo "select * from card where node_id=<NodeId> and slot=<Slot>" | dbaccess and save it in a file.

Step 8 Save the line table information for the line using echo "select * from line where node_id=<NodeId> and slot=<Slot>" | dbaccess

Step 9 Save the log from the client machine from the location "D:\Documents and Settings\banatara\log\CMSCclient.log".

Step 10 Take a copy of the "chassisview.jar" from the location "/opt/svplus/java/jars/cwm/". We need to check that gif files used to draw the lines are available in the jar.

Possible alternative workaround—You can select the lines from the Tree View to launch other applications.

C.7.3 Card Not Displayed in MGX Nodes

Card is not displayed in the Chassis View in MGX nodes.

Step 1 Check that entries for the card is available in the card table.

Step 2 Check whether the lines are defined in the XML file ChassisView.xml.

Step 3 Make sure that the node is in sync (mode is 3).

Defect Information

If the details are not found in the DB, this probably is an EM issue. If the details are found, then

Step 4 Use cwmver to get the Cisco MGM version.

Step 5 Get the node table information for the node using echo "select * from node where node_id=<NodeId> " | dbaccess " and save it in a file.

Step 6 Get the card table information for the card using echo "select * from card where node_id=<NodeId> and slot=<Slot>" | dbaccess and save it in a file.

Step 7 Save the log from the client machine from the location "D:\Documents and Settings\<login-name>\log\CMSCclient.log".

Step 8 Take a copy of the "chassisview.jar" from the location "/opt/svplus/java/jars/cwm/". We need to check that gif files used to draw the lines are available in the jar.

Possible alternative workaround—You can select the cards from the Tree View to launch other applications.

C.7.4 DCA/DCB Status Not Displayed in PXM Cards

DCA/DCB status is always greyed in Chassis View. DCA/DCB status information is not received from the switch. So the status is not displayed or updated.

C.7.5 Ethernet Status Not Updated in PXM Cards

Ethernet status is received only when the Chassis View is launched. Dynamic changes in states of the ethernet status is not updated in Chassis View.

C.7.6 HIST, CBRX, CBTX Status Not Updated in MGX Nodes

For MGX nodes, only CPUOK LED status is updated in Chassis View. Chassis View is not managing the LEDs for HIST, CBRX, CBTX.

C.7.7 RPM Card Status not Updated

Dynamic event updates are not generated for RPM cards on MGX PXM1-based nodes. So, Chassis View does not get event updates on hot insertion or removal of RPM cards. Anyway the card will be identified when cold start is done.

C.7.8 RPM Secondary Card Status Is Blue

For RPM cards, stand-by state will show the card status in blue color as the card has only one LED(CPUOK) to show the status of the card unlike the other cards. For other types of cards, stand-by state will be indicated by yellow LED. This has been documented in Columbia Software Functional Spec.(EDCS 251024).

C.7.9 Lines Not Displayed in Secondary Card

If two cards are in a redundancy relationship, the primary card (i.e. the logical slot) is used to display the children and for all provisioning and troubleshooting activities, even if the primary slot becomes a standby. The secondary slot will not show any children under it even if it becomes active. Hierarchical views in all applications behave in this manner. Similarly, provisioning will be allowed only on the working line of an APS pair, irrespective of whether that line is currently active or not. However, monitoring will be done on both working and protection lines.

C.7.10 Lines Not Selectable

Some times lines become unselectable. For example, when trying to select line 3, line 1 may get selected or vice versa.

Step 1 Lines must be spaced sufficiently apart. If they are not spaced sufficiently apart, they may overlap resulting in this sort of a behavior.

Defect Information—Collect the following information for further analysis:

- Get the copy of ChassisView.xml file used.
- Take a copy of the "chassisview.jar" from the location "/opt/svplus/java/jars/cwm/". We need to check that gif files used to draw the lines.

Possible alternative workaround—Try selecting from the Tree View.

C.7.11 Wrong Tooltip Is Displayed

When we move the cursor over a line, wrong tooltip is displayed. For example when moving the cursor below the last line in the card, the tooltip of the line gets displayed instead of the tooltip of the card.

Step 1 Lines must be spaced sufficiently apart. If they are not spaced sufficiently apart, they may overlap resulting in this sort of a behavior.

Defect Information—Collect the following information for further analysis:

- Get the copy of XML file used. ChassisView.xml for MGX nodes and BPXIGX.xml for BPX/IGX nodes.
- Take a copy of the "chassisview.jar" from the location "/opt/svplus/java/jars/cwm/". We need to check that gif files used to draw the lines.

Possible alternative workaround—Try selecting from the Tree View.

C.8 Configuration Management - Elements

The Configuration Center management functions are divided into the following categories.

- Network elements - Manages the nodes and their components. For network element management, the Configuration Center communicates with the Config Server process.
- Connections - Manages the connections between the nodes. For connection management, the Configuration Center communicates with the Connection Management (CM) Server process.

This section describes trouble shooting guidelines for the element management (Configuration Center; Elements Tab). The Connection Management (Configuration Center; Connections Tab) section describes trouble shooting guidelines related to Connection Management.

This section includes the following information:

- C.8.1 Configuration Center Framework
- C.8.2 Configuration Center; Element Management

C.8.1 Configuration Center Framework

The Configuration Center uses the Cisco MGM framework and workflow mechanism to launch applications and drag and drop objects across application.

- Network elements can be selected in the tree view and the Configuration Center (Elements Tab) can be launched to view/modify the selected object.
- Network elements can dragged and dropped from other application to Configuration Center's Elements tab for modification.

This section includes the following information:

- C.8.1.1 Cannot Launch Configuration Center
- C.8.1.2 Cannot Launch Other Application from Configuration Center
- C.8.1.3 Exception Raised When Configuration Center Is Launched
- C.8.1.4 Exception Raised When Configuration Center Launches Other Application
- C.8.1.5 Element Tab—Double Click In Tree View Does not Launch An Internal Frame
- C.8.1.6 Element Tab—Drag and Drop Does not Launch An Internal Frame
- C.8.1.7 Element Tab—Create/Details/Modify/Refresh Button Issues
- C.8.1.8 Element Management—Drag and Drop Within Configuration Center
- C.8.1.9 Cross Application—Configuration Center as Drag Source

- C.8.1.10 Cross Application—Configuration Center Element Tab as Drop Target
- C.8.1.11 Element Tab—Internal Frame Displays Incorrect Object or Object Data
- C.8.1.12 Configuration Center's Element Tab Does Not Respond (GUI Is Grayed-Out)

C.8.1.1 Cannot Launch Configuration Center

The Configuration Center cannot be launched using one of the following methods:

- Click the Configuration Center icon from the Launch Center or from any application.
- Choose Tools > Configuration Center from any application.
- Right-click the selected node from the Hierarchical Tree, and choose Configuration Center.

Step 1 Check configcenter.jar file

Make sure configcenter.jar file is under the /opt/svplus/java/jars/cwm directory on the target machine.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.2 Cannot Launch Other Application from Configuration Center

The Configuration Center does not launch other applications using one of the following methods:

- Choose the target application under the Tools menu item.
- Right-click on the selected object from the Hierarchical Tree, and choose target application.

Step 1 Check the target application jar file

Make sure the target application jar file exists under the /opt/svplus/java/jars/cwm directory on the target machine.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.3 Exception Raised When Configuration Center Is Launched

When the Configuration Center is launched, using one of the methods described above, an exception is raised and the Java Console shows the exception trace information.

Defect Information—Collect the following information for further analysis:

- Collect Java Console information.
- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.4 Exception Raised When Configuration Center Launches Other Application

When Configuration Center launches another application, using one of the methods described above, an exception is raised and the Java Console shows the exception trace information.

Defect Information—Collect the following information for further analysis:

- Collect Java Console information.
- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.5 Element Tab—Double Click In Tree View Does not Launch An Internal Frame

When Element tab is selected, the Double click on a supported network element does not create an internal frame or recycle the content of an existing internal frame to display the double clicked object

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.6 Element Tab—Drag and Drop Does not Launch An Internal Frame

When Element tab is selected, the Drag and Drop of supported network elements to the Element tab's content pane does not create an internal frame or recycle the content of an existing internal frame to display the dropped object.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.7 Element Tab—Create/Details/Modify/Refresh Button Issues

When Element tab is selected and an object is displayed in an internal frame, the Create/Details/Modify/Refresh buttons either do not launch other internal frames for further provisioning or they do not update the UI with data for the selected operation.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.8 Element Management—Drag and Drop Within Configuration Center

The Drag and Drop (DnD) of a network element from the Configuration Center Tree View to the Element tab's content pane:

- Fails to open an internal frame
- Fails to recycle the contents of an existing frame to display the object's attributes
- Results in the 'Operation Not Supported' message dialog box.

Step 1 Determine that the DnD operation is supported for the dropped object

The following objects can be dropped from the Tree View to the Configuration Center content pane; For the 'Element Tab', the Network, Node, Card, Line, Port, IMA, IMA links objects are supported and 'Folder' objects are not supported. For 'connection tab', the Node, Card, Line, Port objects are supported and 'Folder', IMA and IMA link objects are not supported.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions)
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.9 Cross Application—Configuration Center as Drag Source

As drag source, the DnD of an object from Configuration Center's tree view or element tab to another Cisco MGM application fails to display the selected object in the target application.

Step 1 Determine the DnD operation is supported for the selected object

Determine that the target application supports the DnD operation for the dropped object.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions)
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.10 Cross Application—Configuration Center Element Tab as Drop Target

The DnD of a network element from another Cisco MGM application to the Configuration Center's element tab content pane (a) fails to open an internal frame, (b) fails to recycle the contents of an existing frame to display the dropped object's attributes or (c) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine the DnD operation is supported for the dropped object

The following objects can be dropped from the Tree View to the Configuration Center content pane; For the 'Element Tab', the Network, Node, Card, Line, Port, IMA, IMA links objects are supported and 'Folder' objects are not supported. For 'connection tab', the Node, Card, Line, Port objects are supported and 'Folder', IMA and IMA link objects are not supported.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions)
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.11 Element Tab—Internal Frame Displays Incorrect Object or Object Data

The Element tab successfully creates the internal frame but displays either information related to another object or the object's attribute values are not valid.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions)
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.1.12 Configuration Center's Element Tab Does Not Respond (GUI Is Grayed-Out)

The Configuration Center's Element tab does not respond and the GUI is grayed-out.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.8.2 Configuration Center; Element Management

The Configuration Center can be used to configure different network element object. The Configuration Center's element tab is the main window for creation, modification and viewing of network elements. The network element tab used the Cisco MGM 'Internal Frame' mechanism to display the attributes (groups and categories) associated with a particular network element. The following sections describe guidelines for trouble shooting issues related to creation, modification and viewing of network elements.

This section includes the following information:

- C.8.2.1 XML Parsing Error
- C.8.2.2 SNMP No Data Error
- C.8.2.3 Details/Create/Delete/Refresh Buttons Are Not Enabled (highlighted)
- C.8.2.4 SNMP Timeout Error
- C.8.2.5 SNMP Set Error
- C.8.2.6 Object Not Found In Tree View Error
- C.8.2.7 Element Data Inconsistent With Switch
- C.8.2.8 Config Server Reported Error Messages

C.8.2.1 XML Parsing Error

XML Parsing error is seen while launching a Configuration Center GUI (either by drag and drop method or right-lick method) for a network element. The pop-up window says "Internal Error: XML Parsing Error". The diagram below shows the error message dialog box:

Check if the network element which resulted in this error is supported in the Cisco MGM version being used. A list of the supported nodes/cards can be found in Reference

If this error is seen for a supported node/card go to step 2:

Step 1 Open /opt/svplus/log/configserver.log file and look for the message information when this error occurred.

a. A typical message in the log looks like this:
ERR: Fatal Error at file, line 0, char 0, Message: An exception occurred! Type:RuntimeException, Message:The primary document entity could not be opened.
Id=/opt/svplus/xml/configcenter/XXX/XXX-XXX.xml
(<someNumber>: <x>) <someTimeStamp> ERR: InternalError: XML Parsing Error

b. If the .xml file name mentioned above has two consecutive hyphens (example: ABC--XYZ.xml), or if it has a preceding hyphen (example: -ABC.xml) or terminates with hyphen before the file extension (example: ABC-.xml) proceed to step 3, where investigating incorrectly formed XML file names is discussed.

c. Check if the .xml mentioned in the log message (as shown in the above step) exists. If it does not exist, contact Cisco MGM engineers.

Step 2 This step is to investigate incorrectly formed XML file name strings. As a first note, the format of XML file names is <Platform>-<Card>-<InterfaceType>-<SomeEntityName>.xml. This format is generic with a few exceptions. Also note that Platform, InterfaceType are optional and will not be seen for many files (example: ABC-Card.xml is a valid XML file name).

a. If the Platform part of the XML file name is incorrect/missing, check the NODE table to see if it is correctly populated.

b. If the Card part of the XML file name is incorrect/missing, check the CARD table to verify if it is correctly populated.

c. If the InterfaceType part of the XML file name is incorrect/missing, check the appropriate table to verify if it is correctly populated.This table generally corresponds with the line/port table of the card for which this error is noticed.

d. If the EntityName part of the XML file name is incorrect, contact Cisco MGM engineers, with the Defect Information required (as given below).

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\<username>\log folder
- Collect Java Console information.
- /opt/svplus/log/configserver.log
- "dspcd" command output from the switch for the controller card and the service module where this error is detected.
- "dspln"/"dspport" command output, if this error seen for line/port.

Possible alternative workaround—None.

C.8.2.2 SNMP No Data Error

"SNMP NO DATA" error is seen while launching a Configuration Center GUI (either by drag and drop method or right-lick method) for a network element.

Check if the element for which this error is noticed is active, and that the node is synced up fine (use "selnd" command on the Cisco MGM machine. Check whether the correct community strings are being used.If this error is noticed for a an properly synced up node, on an active element, proceed as follows:

Step 1 Use your favorite SNMP Manager tool to check if the switch is responding to SNMP queries.

The SNMP MIB objects to be queried for a particular dialog can be obtained from .../svplus/log/configserver.log file. See the entries in this log file when this error occurs.

a. Using HP-OV SNMP operations we can perform a walk (on "system" MIB table for this example, using public community string) as: /opt/OV/bin/snmpwalk -c public nodeName system

b. If an error is seen during the SNMP operations (from the SNMP manager tool), verify the switch to cross-check if this information should really be present. If yes, proceed to Step 2.

Step 2 Collect the information from the .../svplus/log/configserver.log file when this error occurs.

a. From the configserver.log file identify the MIB objects that result in this error. Identify the MIB to which these objects belong. Check if these MIB objects are supported from this release.

b. If the objects are supported, but still the SNMP agent is not responding for SNMP queries, get in touch with Cisco MGM engineers for more information.

Defect Information—Collect the following information for further analysis:

- Collect all, complete screen snapshots for the investigative commands used for debugging this issue.
- .../svplus/log/configserver.log
- Related information on the switch.

Possible alternative workaround—None

C.8.2.3 Details/Create/Delete/Refresh Buttons Are Not Enabled (highlighted)

These buttons are enabled or disabled based on the requirement in the tabular view.

A button is disabled when the corresponding operation is not supported.

Open /opt/svplus/log/configserver.log for the MIB

Step 1 If "Create" button is disabled, use any SNMP tool to create the object using SNMP SET operation. If the SNMP SET operation passes, contact Cisco MGM engineers, else go to step 1.1

a. SSH or Telnet to CLI and try to up/add the element. If the operation succeeds, then contact Cisco MGM engineers

Step 2 If "Delete" button is disabled, use any SNMP tool to delete the object using SNMP SET operation. If the SNMP SET operation passes, contact Cisco MGM engineers else go to step 2.1

a. SSH or Telnet to CLI and try to down/delete the element. If the operation succeeds, then contact Cisco MGM engineers.

Step 3 The only reason why a "Details" button is disabled is that all the information related to the element are already displayed in the tabular view. Check the configserver.log file and find if any MIB Entry appropriate to the element is available. If so, go to step3.1

a. Perform a SNMP WALK on the MIB entry using any SNMP tools. If there are any information additional to what being displayed in the tabularview and if it is important to be displayed in the frame, contact Cisco MGM engineers

Step 4 The only reason why a "Refresh" button is disabled is that all the information displayed in the frame are READ_ONLY. If there are any editable fields and the "Refresh" button is disabled, contact Cisco MGM engineers

Defect Information—Collect the following information for further analysis:

- Collect all, complete screen snapshots for the investigative commands used for debugging this issue.
- /opt/svplus/log/configserver.log

Possible alternative workaround—For Creating/Deleting elements, we can either use SNMP SET operation on the Cisco MGM machine or CLI commands on the Switch.

C.8.2.4 SNMP Timeout Error

This error is thrown when an user tries to set/get values to/from SNMPCOMM and will look like the following.

Check the sync-up, link0, link1 status of the Node in the inspectorview.

Step 1 If it is "Unmanaged" or "Unreachable" or "Failed in Sync" or "Partially Synced", Check the connectivity of the Node using "ping" or "telnet" or any other such utility.

Defect Information—Collect the following information for further analysis:

- Collect all, complete screen snapshots for the investigative commands used for debugging this issue.
- /opt/svplus/log/configserver.log

Possible alternative workaround—None

C.8.2.5 SNMP Set Error

This error occurs when SNMP SET operation is done on an unmodifiable MIB object or with invalid values.

A sample snapshot of SNMP SET Error is shown below.

Step 1 Open the /opt/svplus/log/configserver.log.

Step 2 Check for the document name being used. Look for the last part of the document name.

For Example, if the document name is AAA-BBB-CCC.xml, then the document AAA-BBB-CCC.xml can be found at /opt/svplus/xml/configcenter/CCC/ directory. If the file is available, then go to step2, else contact Cisco MGM engineers.

Step 3 Open the document got from step1 and check the 'Access' of the MIB object in the XML file and check the same in /opt/svplus/mibs directory. If the 'access' from XML file and MIB definition are not same contact Cisco MGM engineers, else go to step3.

Step 4 Check the 'Range' of the MIB object in the XML file and MIB definition are not same contact Cisco MGM engineers, else go to step4.

Step 5 Perform a SNMP SET operation on the MIB object with the same value as given in the GUI and appropriate Community String(as displayed in /opt/svplus/log/configserver.log) using HP-OV. A syntax of SNMP SET operation is shown below.

/opt/OV/bin/snmpset -c private nodeName MIBVariable MIBDataType MIBValue

Step 6 If the SNMP SET operation succeeds, contact Cisco MGM engineers with appropriate defect information.

Step 7 SSH or Telnet to the switch and try to configure the same parameter with the value given in the GUI and SNMP tool. If the CLI does not report error contact Cisco MGM engineers with defect information

Defect Information—Collect the following information for further analysis:

- Collect all, complete screen snapshots for the investigative commands used for debugging this issue.
- /opt/svplus/log/configserver.log

Possible alternative workaround—None

C.8.2.6 Object Not Found In Tree View Error

This error is triggered when a network element is launched from the tabular view of Configuration Center.

Step 1 Collect the information of the object being launched. This can be done in 2 ways.

1. In the tabular view, there will be some minimal information like node name, slot number, line number, trunk number, port number etc.
2. Some minimal information regarding the object being launched will be displayed in the title of the window in the following format.
   a. For a node, the window title will have <NodeName>
   b. For a slot, the window title will have <NodeName>.<SlotNumber>

c. For a line, the window title will have <NodeName>.<SlotNumber>.<LineNumber>

d. For a port, the window title will have <NodeName>.<SlotNumber>.<PortNumber> and so on.

Step 2 With the information obtained from Step1, Check if that object is appearing in the tree view.

a. If it does appear, go to step 3.

b. If it doesn't appear, refresh the tabular view twice or thrice and check If the object still exists in the tabular view and if it continues giving the same error, contact Cisco MGM engineers with appropriate defect information

Step 3 If the object being launched is a node or card, check if that particular node or card is supported in the Cisco MGM version being used. A list of supported nodes/cards can be found in product literature.

a. If the node or card is supported, go to step 4

Step 4 Open /opt/svplus/log/CMSCclient.log file and check whether the FDN of the object being launched is matching with the information got from the Step1. Contact Cisco MGM engineers. A typical example of the log is shown below.

```
[DD Mon YYYY HH:MM:SS] DEBUG - [appsConfigCenter] :: CcElementInternalFrame :
modifyActionPerformed()
[DD Mon YYYY HH:MM:SS] DEBUG - [appsConfigCenter] CcTabularView : modify()
[DD Mon YYYY HH:MM:SS] INFO - [appsConfigCenter] Selected fdn =
/NW=X/RND=XX/CD=X/LN=X/PT=X
```

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\<username>og folder
- Collect Java Console information.
- Contents of /opt/svplus/log/configserver.log file.

Possible alternative workaround—None

C.8.2.7 Element Data Inconsistent With Switch

Information displayed in the GUI and Switch are not same.

Step 1 First Make sure that the window has been launched for the correct element in the GUI. If yes, go to step 2, else contact Cisco MGM engineers with the defect information.

Step 2 SSH or Telnet to the Switch and change few parameters and check if the change is reflecting in the GUI. If so, go to step3, else contact Cisco MGM engineers.

Step 3 Open /opt/svplus/log/configserver.log file and find the MIB OID of the element which displays inconsistent data.

Step 4 Check if the MIB OID is pointing to correct information that the user is looking for. If they are correct go to step 5, otherwise Contact Cisco MGM engineers.

Step 5 Perform a SNMP GET operation on the MIB object which shows inconsistent data using any SNMP tool. If the value got via SNMP GET operation and that is shown in the GUI are same go to step 6: , else contact Cisco MGM engineers. Syntax of SNMP GET operation in a HP-OV is shown below.

snmpget [-Cf] [options...] <hostname> {<community>} [<objectID> ...]

Step 6 Check the datatype of the MIB object that shows inconsistent data. If the datatype of the MIB object in the configserver.log is same as the datatype as defined in the MIB object definition (available at /opt/svplus/mibs/ directory), go to step 7: , else contact Cisco MGM engineers with defect information.

Step 7 Check the datatype of the MIB object.

a. If the datatype of the MIB object is Bitmap, then convert the decimal value of the MIB object to binary value and compare the bits SET/RESET with the values defined in the MIB object definition and displayed in the GUI. Contact Cisco MGM engineers with defect information.

b. If the datatype of the MIB object is IpAddress, Check if the value is coming in the appropriate format i.e. <aaa.bbb.ccc.ddd>. If the value is not in proper format, contact Cisco MGM engineers.

Defect Information—Collect the following information for further analysis:

- Collect all screen snapshots for the investigative commands used for debugging this issue.
- /opt/svplus/log/configserver.log

Possible alternative workaround—None

C.8.2.8 Config Server Reported Error Messages

This section describes the various kinds of errors that could happen on configserver.

Step 1 Open /opt/svplus/log/configserver.log

Step 2 If Datatype mismatch occurs, the following error message is displayed in the GUI.

And the corresponding error message seen in configserver.log file follows.

```
( 24560: 9) 07:49:14 CRIT: %SnmpCommException-2-NOT_INTEGER_VALUE:
SnmpVar::getInteverValue() incorrectly called for ASN type [4].
```

a. In this case, the datatype of the MIB object defined in the XML file is not same as the datatype of the MIB object definition. Contact Cisco MGM engineers with defect information.

Step 3 If the user tries to enter an invalid value, the following error message is displayed in the GUI with the parameter name being appended.

And the corresponding error message seen in configserver.log file follows.

```
( 17252: 6) 08:31:20 ERR: %SnmpCommException-3-ERR_BADVALUE: Snmp Error[3]: Bad Value;
object [] (index[2]) :
```

Step 4 If the user tries to up/add more than one element, the following error message is thrown in the GUI.

And the corresponding error message thrown in /opt/svplus/log/configserver.log file follows.

```
( 23868: 6) 14:01:09 ERR: %SnmpCommException-3-ERR_GENERR: Snmp Error[5]: General Error;
object [] (index[0])
```

Defect Information—Collect the following information for further analysis:

- Collect all complete screen snapshots for the investigative commands used for debugging this issue.
- Contents of /opt/svplus/log/CMSCclient.log file.

Possible alternative workaround—None

C.9 Connection Management Problems

This section includes the following information:

- C.9.1 Configuration Center GUI; Framework Issues
- C.9.2 Configuration Center GUI; CM Server Reported Errors
- C.9.3 Cmsvr Errors
- C.9.4 CMGRD

C.9.1 Configuration Center GUI; Framework Issues

The Configuration Center management functions are divided into the following categories.

- Connections - Manages the connections

For connection management, the Configuration Center communicates with the Connection Management Server process.

- Network elements - Manages the nodes and their components.

For network element management, the Configuration Center communicates with the Config Server process.

The Configuration Center's connection tab is the main window for creation, modification and viewing of network connections. The Connections tab content pane provides additional tabs for creating connections (Advanced Mode and Quick Mode tabs) and retrieving a list of existing connections (Connection tab).

The Configuration Center uses the Cisco MGM framework and workflow mechanism to launch applications and to create and display connection information.

- Connections can be selected in Cisco MGM applications and the Configuration Center (Connection Tab) can be launched to view/modify the selected connection.
- Connections can be dragged and dropped from other application to Configuration Center's Connection tab for modification.

The following sections describe guidelines for trouble shooting issues related to creation, modification and viewing of network connection using Configuration Center.

This section includes the following information:

- C.9.1.1 Connections Tab—Double Click on a Tree View Does not Launch Connection's Internal Frame
- C.9.1.2 Connections Tab—Drag and Drop Does Not Launch Connection's Internal Frame
- C.9.1.3 Connection List Tab—Cannot Launch Internal Frame To Modify An Existing Connection (Using the Modify Button)
- C.9.1.4 Advanced Mode Tab—Cannot Launch Connection Details Dialog (Using the 'Detail' Button)
- C.9.1.5 Advanced Mode Tab—Cannot Launch Template Details Dialog (Using the 'Template Details' Button)
- C.9.1.6 Cross Application—Cannot Launch Other Application from Connection List
- C.9.1.7 Cross Application—Connection List as Drag Source
- C.9.1.8 Cross Application—Connection Tab's Content Pane as Drop Target
- C.9.1.9 Configuration Center's Connection Tab Does Not Respond (GUI Is Grayed-Out)

C.9.1.1 Connections Tab—Double Click on a Tree View Does not Launch Connection's Internal Frame

The double click operation on a network element in the Tree View on Connection tab (a) fails to open an internal frame, (b) fails to recycle the contents of an existing internal frame to display the double clicked connections attributes or (c) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine that the double click operation is supported for the selected object

The 'Connection tab' supports connection management for the Node, Card, Line and Port objects. The for connect 'Folder', IMA and IMA link objects are not supported.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions).
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.2 Connections Tab—Drag and Drop Does Not Launch Connection's Internal Frame

The Drag and Drop (DnD) of a network element from the Configuration Center Tree View to the Connections tab's content pane (a) fails to open an internal frame, (b) fails to recycle the contents of an existing frame to display the dropped object's attributes or (c) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine that the DnD operation is supported for the dropped object

The 'Connection tab' supports the DnD operation for the Node, Card, Line and Port objects. The DnD of 'Folder', IMA and IMA link objects are not supported.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions).
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.3 Connection List Tab—Cannot Launch Internal Frame To Modify An Existing Connection (Using the Modify Button)

The 'Details' button fails to launch an internal frame to display the connection details for a retrieved connection.

Step 1 Check that the connection status is not in an 'Incomplete' state.

Only connection in 'Ok' and 'Fail' states can be launched for their details using the 'Details' button on the Connection list tab

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions).
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.4 Advanced Mode Tab—Cannot Launch Connection Details Dialog (Using the 'Detail' Button)

The 'Details' button on the Advanced Mode tab fails to launch the 'Connection Details Dialog'.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions).
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.5 Advanced Mode Tab—Cannot Launch Template Details Dialog (Using the 'Template Details' Button)

The 'Template Details' button on the Advanced Mode tab fails to launch the 'Template Configuration Dialog'.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect Java Console information (In particular any java raised exceptions).
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.6 Cross Application—Cannot Launch Other Application from Connection List

For a retrieved connection in the connection list tab, the right click pop-up menu (a) does not launch the selected target application for the connection or (c) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine the operation is supported by the target application.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions).
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.7 Cross Application—Connection List as Drag Source

As drag source, the DnD of a connection from Configuration Center's connection list to another CMSC application fails to display the selected connection in the target application.

Step 1 Determine target application supports connection object drop operations.

Determine that the target application supports the DnD operation for connection objects.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions).
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.8 Cross Application—Connection Tab's Content Pane as Drop Target

The DnD of a connection object from another CMSC application to the Configuration Center's connection tab content pane (a) fails to open an internal frame, (b) fails to recycle the contents of an existing frame to display the newly dropped connection object or (c) results in the 'Operation Not Supported' message dialog box.

Step 1 Java VM

Determine that the source and the target application belong to the same instance of the Java VM. CMSC framework does not support DnD operations across applications belonging to different JVMs.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions).
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.1.9 Configuration Center's Connection Tab Does Not Respond (GUI Is Grayed-Out)

The Configuration Center's connection tab does not respond and the GUI is grayed-out.

Step 1 Try to reproduce the problem in order to collect additional Java related data using Java DOS Window.

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
- Collect Java Console information.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.2 Configuration Center GUI; CM Server Reported Errors

For connection management, the Configuration Center communicates with the Connection Management (CM) Server process to (a) create, modify, delete, retrieve connections and (b) create, modify, delete or retrieve a connection templates. The CM Server throws application exceptions if it cannot successfully complete the requested operation. The CM Server exception contains an error message that describes the error condition. The Configuration Center displays the reported error message to the user for further analysis. In such cases, the problem must be researched on the CM Server side. The CM Server trouble shooting sections describe the steps required to further analyze the CM Server related issues. See C.9 Connection Management Problems. In this section, the required validation and data collection procedures related to the Configuration Center is presented.

This section includes the following information:

- C.9.2.1 Connection Creation/Modification/Deletion/Retrieval Errors
- C.9.2.2 Connection Template Creation/Modification/Deletion/Retrieval Errors

C.9.2.1 Connection Creation/Modification/Deletion/Retrieval Errors

When performing any connection addition/modification/deletion/ retrieval the CM Server could encounter an error and notify the Configuration Center by throwing an application exception error that contains information describing the error. As a result, the Configuration Center will display the error message. The following lists some CM Server related exceptions.

```
DATABASE_ERROR:"Database error [%s]."
UNKNOWN_EXCEPTION: "Program Error. Unknown Exception is caught in [%s]."
SUBSYSTEM_EXCEPTION:"Program Error. Subsystem exception [%s] caught in [%s]"
INTERNAL_ERROR: "Program or System Error. Function [%s] reports: [%s]"
CONNECTION_LOST: "Connection from host [%s] application [%s] lost during request."
UNKNOWN_PARAM_VALUE_TYPE: "Unknown parameter value type [%d] is processed in [%s]."
PARAM_TYPE_VALUE_MISMATCH: "Parameter value [%s] is does not match type [%d]"
VALUE_OUT_OF_RANGE: "Value [%d] is outside of the valid [%d] - [%d] range"
NO_SUCH_CONNECTION_TYPE_ENUM: "No such connection type enum [%d]"
```

```
NO_SUCH_SERVICE_TYPE_ENUM: "No such service type enum [%d]"

NO_SUCH_ENDPOINT_TYPE_ENUM: "No such endpoint type enum [%d]"

NO_PORT_TABLE_INFO_FOR_CARD: "No port table information for card family [%d]"

NO_LINE_TABLE_INFO_FOR_CARD: "No line table information for card family [%d]"

FILTER_REQUIRED:"Filter [%s] is required"

UNEXPECTED_PARAMSET: "CM Server does not expect parameter set [%d]."

UNSUPPORTED_ENDPOINT: "CM Server does not support end point with card type [%s], vs[%s],
interface type [%s], node platform [%s], controller type [%s] for connection type [%s]
service type [%s], endtoend type [%s]."

UNSUPPORTED_PARAMETER_FOR_VISM: "Unsupported parameter setting on the [%s] end. CM Server
does not support [%s] + [%s] PVC's for VISM cards with firmware revision less than [%s]
and card mode set to [%s]."

PROTECTED_CONNECTION: "[%s] end of the connection is protected. Protected connections
cannot be deleted."

UNSUPPORTED_NODE_PLATFORM: "CM Server does not support node platform [%d]."

UNSUPPORTED_CONN_TYPE: "CM Server does not support Connection of type [%d]."

UNSUPPORTED_SERV_TYPE: "CM Server does not support Connection type [%s] , Service type
[%s] and Endtoend type [%s] between Card type [%s] and [%s]."

UNSUPPORTED_SERV_TYPE_ONE_END: "CM Server does not support Connection type [%s] , Service
type [%s] and Endtoend type [%s] on Card type [%s]."

UNSUPPORTED_CARD_PAIR: "Connection between card type [%s] and card type [%s] is not
supported."

NO_SUCH_NODE_ID_IN_DB: "Node id [%d] not found in table [node]."

NO_SUCH_NODE_NAME_IN_DB: "Node name [%s] not found in table [node]."

NO_SUCH_CARD_IN_DB: "Card : Node[%d], Slot[%d] not found in table [card]."

NO_SUCH_LOG_PORT_IN_DB: "Card : Node[%d], Slot[%d], LogPort[%d] (%d - in database), not
found in table [%s]."

NO_SUCH_PHY_PORT_IN_DB: "Card : Node[%d], Slot[%d], Line[%d], PhyPort[%d] (%d - in
database), not found in table [%s]."

NO_SUCH_LINE_IN_DB: "Card : Node[%d], Slot[%d], Line[%d] not found in table [%s]."

NO_SUCH_CONNECTION_IN_DB: "Connection [%s] not found in database"

UP_CONN_FAILED: "Upping Connection Failed. Test Result from switch [%s]"

DOWN_CONN_FAILED: "Downing Connection Failed. Test Result from switch [%s]"

NO_ONE_SEGMENT_HYBRID: "Cannot create one segment hybrid connection."

INCORRECT_LINE_SUBTYPE: "Incorrect Line SubType. Line: Node[%d],slot[%d],ifindex[%d] is
[%d] not [%d]."

INVALID_LINE_NUMBER: "func [%s]:Invalid Line Number(s)."

NO_CONTROLLER_IN_PORT: "node[%s] slot[%d] port[%d] does not have controller of type
[%s]";

INVALID_FDN: "The given FDN format or value is invalid. [%s]"

INVALID_PORT: "Provisioning operations are not allowed on feeder trunk/routing trunk and
XLMI trunk ports. [%s]"
```

Step 1 Verify that the CM Server and databroker are up and running by perform a "psg sdbroker" and "psg cmserver" on the command line.

Step 2 Verify if the CmServer re-started while the operation was being done by checking the cmsvr.log and searching for the string "START OF THE PROCESS". Verify the timestamp if the server process was either re-started while the operation was being performed. Also check for any cmsvr coredumps under /opt/svplus/corefilesdir/

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions).
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.2.2 Connection Template Creation/Modification/Deletion/Retrieval Errors

When performing any connection template creation/modification/deletion/retrieval the CM Server could encounter an error and notify the Configuration Center by throwing an application exception error that contains information describing the error. As a result, the Configuration Center will display the error message. The following lists some CM Server related connection template exceptions.

CONN_TEMPLATE_ALREADY_PRESENT: "The Connection Template[%s] is already present in the conn_template table";

CONN_TEMPLATE_NOT_PRESENT: "The Connection Template[%s] is not present in the conn_template table";

CONN_TEMPLATE_TABLE_INCONSISTENT: "The Connection Template table contains more than one entry for the template[%s]";

CONN_TEMPLATE_PARAMS_NOT_PRESENT: "The Connection Template[%s] is not present in the conn_templ_param table";

DATABASE_ERROR:"Database error [%s]."

UNKNOWN_EXCEPTION: "Program Error. Unknown Exception is caught in [%s]."

SUBSYSTEM_EXCEPTION:"Program Error. Subsystem exception [%s] caught in [%s]"

INTERNAL_ERROR: "Program or System Error. Function [%s] reports: [%s]"

Step 1 Verify that the CM Server and databroker are up and running by perform a "psg sdbroker", "psg xdbroker" and "psg cmserver" on the command line.

Step 2 Verify if the CM Server re-started while the operation was being done by checking the cmsvr.log and searching for the string "START OF THE PROCESS". Verify the timestamp if the server process was either re-started while the operation was being performed. Also check for any cmsvr coredumps under /opt/svplus/corefilesdir/

Defect Information—Collect the following information for further analysis:

- Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- Collect Java Console information (In particular any java raised exceptions).
- Collect cmsvr.log file under the /opt/svplus/log directory.
- Collect configserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.9.3 Cmsvr Errors

The following are some of the most common errors seen when a Provisioning request is issued:

- C.9.3.1 End to End Type Cannot Be PVC for Connections with PNNI Segment
- C.9.3.2 Unsupported Service Type for the Foresight Connections for PNNI/SPVC Endpoints
- C.9.3.3 Ce-Ce Connection Port Speed Should Be Same on Both
- C.9.3.4 Cannot Create One Segment Hybrid
- C.9.3.5 Cannot Add Connection Between -byte Port Header and -byte Port Header for chan type NIW and NIW-replace
- C.9.3.6 Unsupported Service Type - General node-slot-port-version
- C.9.3.7 End Point Not Present in One of the Connection Tables During Modify
- C.9.3.8 Cmsvr—Connection Diagnostics Issues
- C.9.3.9 TestConn or TestDelay Failed With Switch Error
- C.9.3.10 Connection Up/Down/Reroute Failed
- C.9.3.11 Connection Trace Failures

C.9.3.1 End to End Type Cannot Be PVC for Connections with PNNI Segment

When a connection addition is attempted, cmsvr checks its the endpoints and the End to End Type to make sure it is supported. The return error window on the screen states "EndtoEndType cannot not be PVC for connections with a PNNI segment ".

The problem must be fixed on the CM GUI while adding the connection.

Step 1 Verify that the endpoints that are being used to add the connection are not on PNNI nodes or feeders to PNNI nodes.

Step 2 Change the End to End Type in the CM GUI to either SPVC or Hybrid (as the case might be).

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—None.

C.9.3.2 Unsupported Service Type for the Foresight Connections for PNNI/SPVC Endpoints

During connection addition, an eror in the return error window on the screen could state "CM Server does not support Connection type[], Service type[], and Endtoend type []between Card type and []." The parenthesis are filled with appropriate values.

We need to determine if the service type is applicable to the endpoints.

Step 1 Determine the cards on which the connection is being added and the service type given in the GUI.

Step 2 This error is thrown when the service type is either abr-fs, atfst for a PVC, SPVC or Hybrid end to end type and the card is either a pxm, axsm, rpm or frsm12 card.

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—Change either the endpoints or the service type to add the connection.

C.9.3.3 Ce-Ce Connection Port Speed Should Be Same on Both

While adding a CE-CE connection this error message might be thrown "For Ce-Ce Connection Port Speed should be same on both sides. Port Type should be same except for Structured 8T1 and E1"

Step 1 Make sure that the port speed is same for both the local and remote endpoints.

Step 2 Also the port types should be the same for both the endtypes except for Structured 8T1 and 8E1.

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—Change the endpoints accordingly to add the connection.

C.9.3.4 Cannot Create One Segment Hybrid

While adding a one segment connection, a check is made to make sure that it is not a Hybrid connection. The following error will pop up if that is the case. " Cannot create one segment hybrid connection."

Step 1 Make sure the End to End Type is not Hybrid for a single segment connection.

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—Change the end to end type as something other than Hybrid.

C.9.3.5 Cannot Add Connection Between -byte Port Header and -byte Port Header for chan type NIW and NIW-replace

During a connection addition between two FRSM_12 ports, the cmsvr checks to see if the port headers are the same (4-byte or 2-byte) for both the end points. An error is thrown if they are not. "Cannnot add Connection between 4 byte port header to 2 byte port header for chan type NIW or NIW-replace."

Step 1 Determine what port header was used while creating the port in question. Then use ports with matching port headers to create the connection.

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—None

C.9.3.6 Unsupported Service Type - General node-slot-port-version

During a Connection addition the cmsvr checks the node/slot/port versions to ensure that the service type is supported on that version of the node/card/port.

Step 1 Make sure that the said version of the node/slot or port support that service type from Cisco MGM.

Step 2 Check the ConnGroupService.mib as an additional check for the versions and the supported parameters.

Defect Information—Collect the cmsvr logs, in the directory /opt/svplus/log.

Possible alternative workaround—None

C.9.3.7 End Point Not Present in One of the Connection Tables During Modify

When a connection modification is attempted and an error window on the screen states "Connection [] not found in database"

Step 1 Verify that a row (entry) exists for the connection in the user_connection. A query in the form

%> echo "select * from user_connection where l_node_id = A and l_slot = B and l_port = C and l_subchnl_1 = D and l_subchnl_2 = E" | dbaccess stratacom

Step 2 If it does not look in the corresponding connection table (connection - for FR, atm_connection for atm segments, cesm_connection for cesm segments, rpm_connection for rpm segments and voice_conn for vism segments) to see if the connection exists there.

Step 3 If it doesn't look in the dbkr_temp table for an entry for that connection.

Defect Information—The following log files need to be collected:

Collect the cmsvr, sdbroker and corresponding em logs, in the directory /opt/svplus/log.

Collect the outputs of the database entries for the endpoints in the segment tables and user_connection table.

Possible alternative workaround—Resync the node or wait for synchup to complete

C.9.3.8 Cmsvr—Connection Diagnostics Issues

The cmsvr processes validates and services the Connection provisioning requests from the CM GUI.

If the request is for connection addition, modification, deletion or connection trace, the request is forwarded to cmgrd process through ILOG(IPC) request. If the request is for connection diagnostics like testdelay, testconn etc. (except conntrace), cmsvr sends to snmpcomm process for forwarding to switch.

C.9.3.9 TestConn or TestDelay Failed With Switch Error

Connection diagnostics(testdelay/testcon/up/down/reroute) failures with one of the following error messages:

- TestDelay failed with Switch error
- TestConn failed with Switch error

Step 1 Query the connection information from the user_connection table for that connection

If possible, execute the testdelay/testcon diagnostics for the same connection from ConnProxy (Service Agent) and verify the results

Step 2 Query the connection information from the switch CLI and verify the connection status (dspcon , dspchan etc.)

Execute the testdelay/testcon diagnostics from switch CLI and verify the results matches with what was reported in Cisco MGM(tstdelay, tstconn)

Defect Information

1. Capture selnd output
2. Copy all the cmsvr logs from /opt/svplus/logs directory
3. Capture the user_connection table query output from Cisco MGM DB for the given end point (if the request is not an addition request)
4. Capture the switch CLI output for the testdelay/testconn diagnostics on the same connection

Possible alternative workaround—

1. Check the status of the connection and clear any alarms due to line/port issues (adding loopback, correcting the physical cable issues by verifying the physical port connections etc.). After the connection comes up and is in clear state, rerun the testdelay/testconn diagnostics again.
2. Note that testcon is not applicable for single-end SPVC connections and on AXSM card types
3. Note that the connection status should be clear or fail for the testdelay/testcon diagnostics to be executed, otherwise the test will be blocked from cmsvr
4. Note that testconn/testdelay diagnostics cannot be done on RPM to RPM connections
5. Note that testdelay diagnostics is not applicable for VOICE and DATA connections
6. Note that for any connection if the local end of the connection does not support that particular diagnostics, cmsvr will verify if the diagnostics can be executed from the remote end. If the diagnostics is not supported by both the end points of a connection, an appropriate error message will be given to the user.

C.9.3.10 Connection Up/Down/Reroute Failed

Connection up/down/reroute diagnostics failures with switch error

Step 1 Query the connection information from the user_connection table for that connection

Step 2 Query the connection information from the switch CLI and verify the connection status (dspcon, dspchan etc.)

Execute the up/down/reroute diagnostics from switch CLI and verify the results matches with what was reported in Cisco MGM(upcon, dncon, rrtcon)

Defect Information

1. Capture selnd output
2. Copy all the cmsvr logs from /opt/svplus/logs directory
3. Capture the user_connection table query output from Cisco MGM DB for the given end point (if the request is not an addition request)
4. Capture the switch CLI output for the up/down/reroute diagnostics on the same connection

Possible alternative workaround:

1. Check the status of the connection and clear any alarms due to line/port issues (adding loopback, correcting the physical cable issues by verifying the physical port connections etc.). After the connection comes up and is in clear state, rerun the up/down/reroute diagnostics again.
2. Verify the connection status to find if the connection is already down, when trying to do a down operation or the connection is already up when trying to do an up operation.
3. Note that connection reroute might take the connection to FAIL state for a while, if it is rerouted.

C.9.3.11 Connection Trace Failures

Connection trace returns a failure.

Step 1 Make sure the connection is not in Fail state, connection trace does not work on failed connections, Cisco MGM does not block this request as well.

Query the connection information from the user_connection table for that connection

Step 2 Query the connection information from the switch CLI and verify the connection status (dspcon, dspchan etc.)

Execute the connection trace diagnostics from switch CLI and verify the results matches with what was reported in Cisco MGM(conntrc, dsptrcbuffer)

Defect Information:

1. Capture selnd output
2. Copy all the cmsvr logs from /opt/svplus/logs directory
3. Copy all the cmgrd logs from /opt/svplus/logs directory
4. Capture the user_connection table query output from Cisco MGM DB for the given end point (if the request is not an addition request)
5. Capture the switch CLI output for the trace diagnostics on the same connection

Possible alternative workaround:

1. Check the status of the connection and clear any alarms due to line/port issues (adding loopback, correcting the physical cable issues by verifying the physical port connections etc.). After the connection comes up and fine in clear state, rerun the trace diagnostics again.
2. Verify the connection status. If the connection status is down trace cannot be executed on the connection. If the connection status is failed, probability is more that the trace result will be an empty string
3. Note that connection trace cannot be executed on an incomplete, or DAX PNNI segment connections

C.9.4 CMGRD

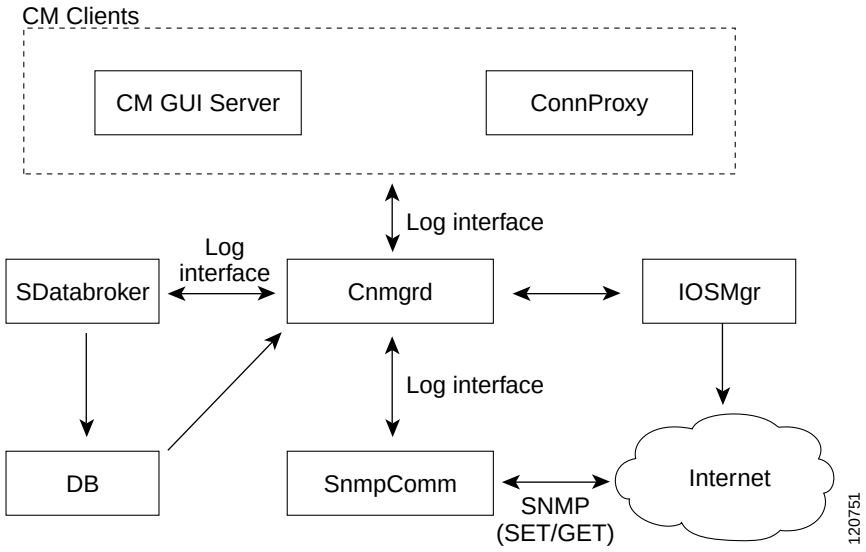
This section includes the following information:

- C.9.4.1 High Level Connection Subsystem Architecture
- C.9.4.2 Cmgrd - Sdbroker Errors
- C.9.4.3 Cmgrd Errors
- C.9.4.4 Cmgrd—Switch Errors

C.9.4.1 High Level Connection Subsystem Architecture

Figure C-6 gives a high level view of the Connection Management Subsystem.

Figure C-6 Connection Management Subsystem



Related key index entries: connproxy, cmserver, xcmgrd, cmgrd

The Connection subsystem comprises the following modules:

- ConnProxy—Is the SNMP Agent Interface for Connection Management, client to cmgrd.
- CmServer—Provides the backend functionality to the Connection Management GUI, client to cmgrd.
- Cmgrd—Is the backend module which accepts requests from ConnProxy, CmsServer Clients and issues the SNMP Varbinds to the Switch for Addition, Modification and Deletion. Subsequently cmgrd informs sdbroker after an ADD/MOD/DEL operation for the status of the particular request, upon which sdbroker updates the Cisco MGM database.

The following errors are applicable to all types of connections PVC, SPVC, XPVC, and Hybrid.

C.9.4.2 Cmgrd - Sdbroker Errors

During an Addition request cmgrd could return errors which cmgrd has received from sdbroker, the following are some of the most common errors seen when a Provisioning request is issued.

This section includes the following information:

- C.9.4.2.1 Cmgrd—Sdbroker Addition/Modification/Deletion Errors. Adding a Connection Results in an Error "Fail to Communicate with sDatabroker"
- C.9.4.2.2 Cmgrd—Sdbroker Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "sDatabroker process busy. Please retry"
- C.9.4.2.3 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "MGM syncup in progress".
- C.9.4.2.4 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "No more vpi/vci available for local trunk end".
- C.9.4.2.5 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "EndPoint Exists Local/Remote/Both end of the connection already exists.".
- C.9.4.2.6 Cmgrd—Sdbroker Modification/Deletion Errors. Modifying or Deleting a Connection Results in an Error "sDatabroker Could not lock connection entry.".

C.9.4.2.1 Cmgrd—Sdbroker Addition/Modification/Deletion Errors. Adding a Connection Results in an Error "Fail to Communicate with sDatabroker"

Related key index entries: cmgrd, sdbroker

When any Connection Add/Mod/Del request is made, cmgrd checks its ILOG connection with sDatabroker. The above error will result when cmgrd could not verify that sdbroker is available for servicing requests. In other words the ILOG connection between them is broken.

The problem must be researched on the sdbroker side.

Step 1 Verify that the sdbroker is up and running. Do a "psg sdbroker" on the command line.

Step 2 View the sDbroker log for ilog errors There could be multiple sdbrokers running on the machine, the way to check which sdbroker cmgrd talked to for that particular request is as follows.

a. vi the cmgrd.log file, and go to the very end of the file. Then do a backward search for the string sdbroker, that string should indicate the number (#) of the sdbroker that cmgrd could not talk to.

b. Do a "psg sdbroker" and then check the corresponding log file of this sdbroker.

Defect Information:

- stack trace of the sdbroker process "pstack <pid of sdbroker>"
- sdbroker and cmgrd logs.

Possible alternative workaround—None.

C.9.4.2.2 Cmgrd—Sdbroker Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "sDatabroker process busy. Please retry"

Related key index entries: cmgrd, sdbroker

The return error window on the screen states "sDatabroker process busy. Please retry". This indicates that the CMGRD was able to process the request and send it to the sDbroker, but the sDbroker did not respond prior to the CMGRD'S request time-out. Communication between the CMGRD and sDbroker appear to be working though.

We need to determine if the sDbkr is "sleeping" or is overburdened with requests.

Step 1 Determine the sdbroker that should be processing the request. Use /opt/svplus/tools/dbcmap command.

Step 2 Check the message log to see if sDbkr is processing lots of other messages during the provisioning time frame. If the message log is unavailable, check the shared memory between EM and DMD. ('count' command). The column EMQDepth and Em R show current status of this shared memory. This will show the sdbroker's processing at the present time not when the provisioning request failed. If there is a large number of entries in the message log file, or the EM is pumping lots of messages to DMD, the sDbroker is truly busy and the operator should wait for the system to catch up with current alarm events.

Defect Information:

- If the sdbroker is processing many traps (> 20/second) during the time of the provisioning request then there is no sDbkr defect. Investigate the switch / NTS / EM if you feel that there should not be this large number of requests occurring at the given time.
- If the sDbroker appears to be "sleeping" we need to capture the current status of the sDbkr. Execute the "pstack <pid> " command twice and save the output.

Possible alternative workaround:

Repeated attempts at provisioning should be made. If there is a switch that is sending out many alarms, fixing the problem on the switch is the best solution. If the sdbroker has been 'sleeping' for a long period of time, then it should be killed and restarted.

C.9.4.2.3 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "MGM syncup in progress".

Related key index entries: cmgrd, sdbroker, sync-up

While the system is in the process of syncing up, the user cannot provision connections. The user will be returned the error "MGM syncup in progress"

We need to determine if the system is really in syncup or not. If the system is still syncing up then this is proper operation.

Step 1 View the sync log located in /opt/svplus/log/.DBKR_SYNCHUP_MESSAGE (note the "." before the filename). search for the last "xxx Start Begin at" line where xxx is ether 'Warm' or 'Cold'. Warm start will take a short time compared to Coldstart which could take several hours. If there is a line at the end of the file stating "Declare Syncup Complete" or "Warmstart Cache Rebuild Complete" then syncup is done and there is a problem with dmd.

Step 2 If syncup is not complete, view the start time of syncup. Compare this to the maximum sync time identified in the /usr/user/svplus/config/dmd.conf file next to the keyword SYNCHUP_ALL_NODES_SYNC_WAIT_LIMIT. If the time taken to sync is larger than the time identified in the dmd.conf file, then dmd has a problem.

Step 3 If the system is truly still syncing up, then the system behavior is correct.

Defect Information—If there is a DMD problem, save the dmd, cmgrd, sdbroker logs and message logs along with the .DBKR_SYNCHUP_MESSAGE and .DMD_SYNCHUP_MESSAGE* files located in the /opt/svplus/log directory.

Possible alternative workaround—The user can force the system to declare sync-up by sending the dmd a forced sync signal. This will not place the nodes into mode '3' any faster, but will allow the user to attempt provisioning some nodes, while other nodes are in the process of syncing up.

Step 1 Execute command 'selnd' from the cwm command line. Note the nodes in mode '3'. All connections provisioned after forced sync-up can only go through nodes with mode = 3. (they actually can go through specific cards on nodes in mode = 4, but let's stick with mode 3 nodes for now).

Step 2 Send the sync-up signal to the dmd by entering command "kill -ALRM dmd".

Step 3 view the .DBKR_SYNCUP_MESSAGE file for the sync-up completion.

C.9.4.2.4 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "No more vpi/vci available for local trunk end".

Related key index entries: cmgrd, sdbroker, vpi/vci

Provisioning fails and the error message is displayed.

"No more vpi/vci available for local trunk end" Also "Remote trunk"

"Local end of the connection already exists" Also 'Remote end" and "Both end"

"Vpcon already exists for Local Vpi" Also "Remote Vpi" and "Both ends"

Each of these error messages identifies the reason for the failure of provisioning. They sometimes can be displayed in error. The reason is a mismatch between the switch and the DMD's cache. To find this out, dump the DMD cache "pkill -USR1 dmd" and compare the values in the cache with those on the switch for endpoint associated with the error.

Defect Information—If the switch and DMD cache are not in sync, we will need the DMD logs and message logs, dmd cache dump and the EM logs for the node in question. We will also need the switch CLI screen shot of the connection in question.

Possible alternative workaround—If there is a cache inconsistency, the only work around is a complete cache resync(/opt/svplus/tools/CacheResync). If there is no DMD cache inconsistency, it is a normal operational scenario. Different connection add parameters should be chosen.

C.9.4.2.5 Cmgrd—Sdbroker Addition Errors. Adding a Connection Results in an Error "EndPoint Exists Local/Remote/Both end of the connection already exists.".

Related key index entries: cmgrd, sdbroker, endpoint exists

During a connection add, the cmgrd will request intermediate endpoint vpi/vci from sdbroker. If the sdbroker incorrectly chooses endpoints that are already in use by the switch the cmgrd will try to provision these endpoints and return the error "endpoint exists" to the user.

Step 1 Determine which of the endpoints already exist on the switch. If it is the intermediate endpoints then it is a databroker problem.

a. When provisioning hybrid connections the CMGRD requests intermediate endpoints from the sDbroker. The sDbroker then requests them from DMD and then forwards them back to CMGRD. First identify the DMD which is to process the node use /opt/svplus/tools/dbcmap command. Then dump that dmd's cache. Verify that the DMD does not contain the end points in question in it's cache.

b. We now need to determine why the dmd doesn't have the information on endpoints that exist on a switch. We first need to determine if the EM sent the add message to the DMD. See C.15.2.1 Connection Inconsistency Between the Switch and GUI . If the add message is not found and the logs do not go back to coldstart, then we will need to check to see if EM has done any processing of this endpoint. Check for the endpoint in the xxx_Connection table. If the endpoint is not there, check the EM to determine why it didn't process the endpoint. If the endpoint is in the xxx_connection table we know that EM processed it, but we don't know if it forwarded it to DMD.

Defect Information:

- If the problem is an intermediate endpoint and it is on the switch but EM didn't process it or didn't' send the message to DMD. Check the EM log, nts log from the /opt/svplus/log
- If the problem is within the DMD we ill need the dmd logs, dmd message logs and the dmd cache dump.

Possible alternative workaround—None

C.9.4.2.6 Cmgrd—Sdbroker Modification/Deletion Errors. Modifying or Deleting a Connection Results in an Error "sDatabroker Could not lock connection entry.".

Related key index entries: cmgrd, sdbroker, lock connection

During a Connection Modification or Deletion request the above error could result when sdbroker could not find the connection in its cache.

All scenarios of modify/delete connection failures display the same error to the user. To determine exactly what happened you must view the /opt/svplus/log/sdbrokerX.XXXX.log file.

Step 1 Search for the ERR: "<sDbkr_CmgrdModConn_c::Process> INTERFACE ERROR" near the end of the file. A detailed reason for the error will follow on the same line.

a. Note that for delete connections, search for sDbkr_CmgrdDelConn_c::Process instead of sDbkr_CmgrdModConn_c::Process.

Defect Information:

- If the problem is an intermediate endpoint and it is on the switch but EM didn't process it or didn't' send the message to DMD see section EM logs,nts logs from /opt/svplus/log.
- If the problem is within the DMD we ill need the dmd logs, dmd message logs and the dmd cache dump.

Possible alternative workaround—None

C.9.4.3 Cmgrd Errors

During an Addition request cmgrd could return errors which cmgrd has received from snmpcomm or the switch itself.

This section includes the following information:

- C.9.4.3.1 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Fail due to Switch Timeout"
- C.9.4.3.2 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error “Agent not responding, request timed-out; or Fatal error, SnmpComm is not running.”
- C.9.4.3.3 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Outstanding request exists for same object."
- C.9.4.3.4 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Fatal error, IOSMGR is not running, may need to be manually started"
- C.9.4.3.5 Cmgrd—Addition Errors. Provisioning a Connection Results in an Error "Vpi/vci ranges retrieval from svc_operation failed"
- C.9.4.3.6 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Can't get segment info from Data-base."

C.9.4.3.1 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Fail due to Switch Timeout"

Related key index entries: cmgrd, time-out

When any Connection Add/Mod/Del request is made, cmgrd issues a request to the switch with a Snmp community string, either a SET or GET string. These community strings are overwritten by the process snmpcomm. This process uses the values of the strings which are present in the node_info table. Thus, when a provisioning request times out from the switch, one possible problem is that the node's community string in the node_info table does not match the string on the node itself.

The problem can be researched by checking the community strings on the node and the node_info table.

Step 1 Check the community strings on the nodes by issuing the command "dsnmp".

Step 2 Check the community string in the node_info table based on node_id, the strings are encrypted so use the decrypt binary which would display the string in the clear format.

Step 3 Once the strings are cross-referenced and a discrepancy is indeed present. Then the user can change the strings in the following possible ways:

a. Issue the command "cnfsnmp" on the node and change the community strings to match that of the Cisco MGM.

b. Or the user can use the application RunConfigurator to change the string in the Cisco MGM to match that of the switch.

Defect Information—If the above possible investigations do not work, collect the following

- The cmgrd.log which is located in /opt/svplus/cmgrd.log
- The output of the query "select * from node_info where node_id = X"

Possible alternative workaround—See Investigation.

C.9.4.3.2 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error “Agent not responding, request timed-out; or Fatal error, SnmpComm is not running.”

Related key index entries: cmgrd, snmpcomm

When any Connection Add/Mod/Del request is made, cmgrd issues a request to the switch, but the request is actually first issued to the process snmpcomm. Which in turn sends the SNMP SET/GET to the node. In this scenario the above errors can be returned by the process snmpcomm, the error could be a time out error from snmpcomm process or an ILOG Communication error.

The reason that snmpcomm can send a time-out error is because it is too busy processing requests and cannot accept more requests at the moment. And the reason for the "SnmpComm not Running" error is that cmgrd could not establish and ILOG connection with it. The following basic check can be done:

Step 1 Issue the command "psg snmpcomm" to ensure that the process is indeed running.

Step 2 Check for snmpcomm coredumps in the corefilesdir directory.

Re-issue the request after waiting for few minuteness will take care of the time-out error.

If it is indeed noticed that snmpcomm process is not running, then a warm-start has to be done to ensure that the process does come up.Whn the process starts-up the ILOG connection with cmgrd is established.

Defect Information:

- If after re-issuing the request and still getting the same time-out error than collect the cmgrd.log and snmpcomm .log.
- And if after warm-starting the snmpcomm process does not run, then collect the watchdog.log file.

Possible alternative workaround—Re-issue the request after some time, this interval could enable snmpcomm to clear its pending requests. Do a warm-start to ensure that the snmpcomm process starts up.

C.9.4.3.3 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Outstanding request exists for same object."

Related key index entries: cmgrd, outstanding request

When any Connection Add/Mod/Del request is made, cmgrd process these requests in a multi-threaded manner. Sometimes a request can take greater than 3 minutes to process, because of the different scenarios that the switch responds with (i.e. timeouts.). If the request takes greater than 3 minutes from the CMGui, then the GUI will time-out and indicate this to the user. And from the Connection Proxy path the time-out value is 2 minutes, subsequently it will indicate a time-out error to the user.

The tendency of the user will be to re-issue this request immediately, upon which cmgrd could return the error "Outstanding requests exists for the same object".

The reason that error is returned is because cmgrd is still processing the initial request which the clients (CMGui and Connection Proxy) timed out on. An ideal case for this would be when a switch time-out is received for a multi-segment case, and cmgrd is still busy backing-off other segments and waiting for the time-out response of some other segments. Just to be sure that cmgrd is still running, issue the following commands.

Step 1 Issue the command "psg cmgrd" to ensure that the process is indeed running.

Step 2 Check for cmgrd coredumps in the corefilesdir directory. If there indeed was a coredump collect the corefile.

Step 3 Do a "tail -f cmgrd.log in the logs directory to see if cmgrd is processing requests."

Re-issue the request after waiting for few minutes.

Defect Information—If after re-issuing the request and still getting the same error than collect the cmgrd.log.

Possible alternative workaround—Re-issue the request after some time, this interval could enable cmgrd to clear its pending request.

C.9.4.3.4 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Fatal error, IOSMGR is not running, may need to be manually started"

Related key index entries: cmgrd, iosmgr

When any Connection Add/Mod/Del. request is made with a Popeye1 RPM Card, cmgrd issues a request to the switch, but the request is actually first issued to the process iosmgr. Which in turn sends the request to the node, via an expect script session In this scenario the above error can be returned when cmgrd could not talk to iosmgr via the ILOG Communication.

The reason for the error is that cmgrd could not establish and ILOG connection with iosmgr. The following basic check can be done:

Step 1 Issue the command "psg iosmgr" to ensure that the process is indeed running.

Step 2 Check for iosmgr coredumps in the corefilesdir directory.

If it is indeed noticed that iosmgr process is not running, then a warm-start has to be done to ensure that the process does come up.Whn the process starts-up the ILOG connection with cmgrd is established.

Defect Information—And if after warm-starting the iosmgr process does not run, then collect the runiosmgr.log file.

Possible alternative workaround—None, iosmgr has to be running to be able to Provision on Pop1 RPM cards.

C.9.4.3.5 Cmgrd—Addition Errors. Provisioning a Connection Results in an Error "Vpi/vci ranges retrieval from svc_operation failed"

Related key index entries: cmgrd, svc_operation

This error is only present for Hybrid Connection Add request, cmgrd queries the svc_operation table of the Feeder Trunk ports for the vpi/vci ranges. These ranges in turn are given to sdbroker who in turn returns an available vpi/vci that cmgrd can use to SET on this Feeder Trunk Port.

The reason for the error is that when cmgrd queries the svc_operation table for the feeder trunk ports vpi and vci ranges the entry is not found in the table.

Step 1 Re-issue the Hybrid Addition but tail the cmgrd.log.

Step 2 In this log a query in the form of "SELECT MIN_SVCC_VPI, MAX_SVCC_VPI, MIN_SVCC_VCI, MAX_SVCC_VCI FROM SVC_OPERATION WHE RE NODE_ID = X AND SLOT = X AND PORT + 1 = X" will be seen. This is the actual query that is failing.

Step 3 Run the query from the command line or (dbaccess stratacom prompt) and the user can figure out which ports information is not present in the svc_operation table.

Step 4 The reason could be that for that port the resource partition is not configured on the CLI. The user should go to the CLI and do the command "addpart" for that port.

Step 5 After issuing the command "addpart" on the CLI, the user should check the Cisco MGM table svc_operation database to check for the existing of the row. If the row is present the connection request can be re-issued. If the row still is not present in the svc_operation then it is a probably an EM issue.

Defect Information—If after configuring the resource partition on the CLI, and the svc_operation table is still not populated then see C.5 Equipment Management Problems and collect the appropriate OOEMC logs.

Possible alternative workaround—None.

C.9.4.3.6 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in an Error "Can't get segment info from Data-base."

Related key index entries: cmgrd, segment info

The above error will be returned by cmgrd when it could not get a row from one of the Cisco MGM database tables for the current connection request. If the request is an ADD, then the possibility is that the query for the intermediate endpoints from either the node or the bis_object tables failed. If it is a Mod/Del then in addition to the queries into the node and bis_object tables the problem could be that the connection is not found in the user_connection table.

In this error scenario there could be multiple reasons of failure which differ between and Add and Mod/Del request. But most of the time this error is returned if one of the queries to the node, bis_object and user_connection tables fail for the current request. Some basic checks would be to see if the nodes in question and in the intermediate nodes are really synced up with the Cisco MGM. Also the user should try the same request from both the CMGUI and Connection Proxy paths.

Because of the nature of this error it is best that a Cisco MGM DE investigate.

Defect Information—Collect cmgrd.log, cmsvr.log, ConnProxy*.log and sdbroker*.log.

Possible alternative workaround—None.

C.9.4.4 Cmgrd—Switch Errors

During an Addition/Modification/Deletion request cmgrd sends Snmp Requests to the switch, when the switch rejects the SNMP request, cmgrd queries the Error MIB Table and GETs the error string to display back to the user. Some of the common error strings are indicated below:

- C.9.4.4.1 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Agent reported bad/wrong value for one of the variables in the request."
- C.9.4.4.2 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "Object Exists on the Agent or Specified VPI/VCI not available".
- C.9.4.4.3 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Requested cell rate (lscr/lpcr or rpcr/rscr) is too high"
- C.9.4.4.4 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "SPVC is not allowed on this interface"
- C.9.4.4.5 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "Local Channels not enough."
- C.9.4.4.6 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Error in Traffic Parameters."
- C.9.4.4.7 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in a Switch Error "Network Busy, try later"
- C.9.4.4.8 Cmgrd—Modification Errors. Modifying a Connection Results in a Switch Error "Connection does not exist in CproDb/Agent returned no such name"

C.9.4.4.1 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Agent reported bad/wrong value for one of the variables in the request."

Related key index entries: cmgrd, bad value

When any Connection Add or Mod request is issued, an SNMP VarBind is SET on the switch via cmgrd. The switch can reject this VarBind with the above error.

The reason for the error is that cmgrd sent an invalid value for one of the mib objects. The Cisco MGM DE should do the investigation for this error, as it indicates that there is a problem in the data that cmgrd either received from the clients or internally mapped from the other side of the connection.

The user should try the same connection from both Connection Proxy and CmGui interface and note the behavior from both of the clients. If the provisioning result from both clients is the same, it tends to indicate that this is either a cmgrd issue or a sdbroker vpi/vci issue.

Defect Information—The cmgrd.log, ConnProxy*, cmsvr.log and sdbroker*.logs should be collected.

Possible alternative workaround—If the user is doing a Add, and default values are being used, then there is no work around. But, if the user is doing a MOD and then the user could change the value of the Object that is being modified and retry the connection.Also if this is a sdbroker vpi/vci issue, retry the connection as sdbroker does not re-use the previous vpi/vci combination.

C.9.4.4.2 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "Object Exists on the Agent or Specified VPI/VCI not available".

Related key index entries: cmgrd, object exists

When any Connection Add request is issued, an SNMP VarBind is SET on the switch via cmgrd. The switch can reject this VarBind and the subsequent cmgrd query to switch error table can return the above errors.

The reason for the error is that the connection that Cisco MGM is trying to Add already exists on the switch. This could be a user endpoint or an intermediate endpoint.

Step 1 The user should retry the same connection, if this second attempt succeeds it indicates that the intermediate endpoints vpi/vci was already present on the switch. If this is the case look at the cmgrd-sdbroker error "EndPoint Exists Local/Remote/Both end of the connection already exists".

Step 2 If on the second attempt the switch still returns the same error. Then this has to be debugged by a Cisco MGM DE, as it could indicate an inconsistency between the Cisco MGM database and the Switch.

Defect Information—Save the cmgrd.log, ConnProxy*.log, cmsvr.log and sdbroker*.log.

Possible alternative workaround—Retrying the connection addition more than once, if that still fails a Cisco MGM DE has to look into the issue.

C.9.4.4.3 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Requested cell rate (Iscr/Ipcr or rpcr/rscr) is too high"

Related key index entries: cmgrd, cell rate

During a connection Addition/Modification request it is possible that the port the connection is being SET on, has no more resources available to accept the traffic parameters that the current Snmp SET is requesting, at this point the Switch will reject the request with the above error.

Step 1 For the user endpoint check the user port on the CLI via the command "dsppnportrsrc" this will indicate the resource available per port

Step 2 Check the Switch TSG EDCS-235791, section 1.3.4 for further information on how to debug this issue.

Step 3 If the failure is not happening on a user endpoint port, and instead on an Intermediate port (i.e. for Multi-Segment connections) then find out the local and remote endpoint feeder trunk ports (This can be done easily by using the Network Topology GUI). On the CLI check the "dsppnportrsrc" for these feeder trunk ports.

Defect Information—If after checking that the ports have enough bandwidth to add these connections and still the error is being returned then save the cmgrd.log.

Possible alternative workaround—Freeing up resources on the port which needs the bandwidth to add the connection, or lowering the traffic parameters value in the connection request.

C.9.4.4.4 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "SPVC is not allowed on this interface"

Related key index entries: cmgrd, interface

During a connection Addition request it is possible that the user endpoint port that the connection is being SET on, has an incorrect signalling configured on it, the above error is indicative of this condition.

For non trunking ports the signalling on the port cannot be "pnni".

Step 1 For the user endpoint port check the CLI for the following:

a. Interface is pnni port or controller port, check interface using "dsppnport"

b. Change port to UNI port. Before doing this make sure that no calls are going through this interface.

dnpnport <portID>

cnfpnportsig <portID> -univer uni30

Step 2 After changing the configuration retry the connection request.

Defect Information—Not applicable, as the above error has to be a Switch Configuration issue.

Possible alternative workaround—Indicated in the Investigation part.

C.9.4.4.5 Cmgrd—Addition Errors. Provisioning a Connection Results in a Switch Error "Local Channels not enough."

Related key index entries: cmgrd, channels

During a connection Addition request it is possible that the user endpoint port or card that the connection is being SET on, has already reached its limit of allowable connections.

Check the port or card of the user endpoints on the CLI.

Step 1 Check the port resources of the endpoint via "dsppnportrsrc".

Step 2 If the number of LCNs is zero, delete some connections from this interface.

Step 3 After changing the configuration retry the connection request.

Defect Information—Not applicable, as the above error has to be a Switch Configuration issue.

Possible alternative workaround—Indicated in the Investigation part.

C.9.4.4.6 Cmgrd—Addition/Modification Errors. Provisioning a Connection Results in a Switch Error "Error in Traffic Parameters."

Related key index entries: cmgrd, traffic parameters

During a connection Addition/Modification request if the local endpoints remote parameters do not match the remote endpoints local parameters, then the above error is indicated by the switch. The particular parameter depends on the Service type of the connection.

This error cannot be easily debugged it has to be looked at by a Connection Management DE. Because the error indicates that the mapping of local to remote (and/or vice versa) has a problem in the value that is being SET on the Switch.

Step 1 Retry the connection from both CMGUI and Connection Proxy interfaces.

Step 2 If the result from both the interfaces is the same this could be a cmgrd bug. If the request succeeds from one of the interfaces then this is more possibly a Client issue.

Defect Information—Collect cmgrd.log, ConnProxy*.log and cmsvr.log.

Possible alternative workaround—Change some of the traffic parameter values in the connection request and re-try the connection.

C.9.4.4.7 Cmgrd—Addition/Modification/Deletion Errors. Provisioning a Connection Results in a Switch Error "Network Busy, try later"

Related key index entries: cmgrd, network busy

During a connection Addition/Modification request if the switch returns the above error, it indicates that there is some CPU intensive activity happening on the Controller Card. The Cmgrd request will be backed off the other segments and the error will be Returned to the user. But, for a Delete operation (since it is a Destructive command) the operation will not be backed off.

The error has no work around, the user has to wait and try the request on the Switch later. If after waiting and retrying multiple times and the error keeps repeating, then it has to be looked at from the Switch side.

Defect Information—Not applicable.

Possible alternative workaround—Wait and try the connection at a later time.

C.9.4.4.8 Cmgrd—Modification Errors. Modifying a Connection Results in a Switch Error "Connection does not exist in CproDb/Agent returned no such name"

Related key index entries: cmgrd, cprodb

During a connection Modification the switch could return the above error when the connection is truly not present on the switch.

The user should check the connection in the user_connection table. From this entry the user should check that all of the segments do exist on the switch CLI. If all segments are truly present in the switch CLI then the issue has to be looked at from the Switch side. But, if any one of the segments is not present on the switch then this could be a sdbroker or EM issue.

Defect Information—If it is deemed a sdbroker or EM issue collect the appropriate logs and also collect cmgrd.log. If all of the segments of the connection are present on the switch and the switch still returns this error, contact the switch DEs.

Possible alternative workaround—None.

C.10 Diagnostics Center Problems

The Diagnostics Center provides different diagnostics operations at the following different network elements levels.

Network Diagnostics

- Retrieve the current sync-status, alarm status of all the nodes in the network.
- Support the Network/Node Health Statistics and Manageability Checks. At the network level, only the node manageability checks results are supported.

Node Diagnostics

- Retrieve current sync status, node alarm status, ipaddress and several other node attributes.
- Retrieve the sync status of all the cards in the node.
- Request to do the Node Resync.
- Request VSI Partition Data and also perform VSI Consistency Checks on the node.
- Support Node Health Statistics such as SNMP Success Count, FTP/TFTP Success/Failure Counts etc.
- Perform Node Manageability Checks such as IP Reachability, SNMP Community String Check etc.

Card Diagnostics

- Retrieve Card Level information (sync status, card status, firmware rev etc.)
- Retrieve Card CPU Usage on cards that support this functionality.
- Retrieve the Memory Pool Usage Information on cards that support this functionality.
- Retrieve the Memory Buffer Pool Usage Information on cards that support this functionality.
- Retrieve Card Level Real Time Statistics if any.
- Retrieve information about all lines and paths that are in loopback on the card.
- Retrieve information about currently running BERT tests on the card.
- Retrieve information about currently running IMA Link tests.

Port Diagnostics

- Retrieve the Port Level Attributes such as Port Status etc.
- Perform Loopback.
- Perform start/stop/modify BERT
- Retrieve the results and/or current status of the BERT
- Monitor the Scheduled Grooming Results
- Configure the On Demand Grooming
- Retrieve the Port Level Real Time Statistics

Line Diagnostics

- Retrieve the Line Level Attributes such as Line Status, Loopback Status etc.
- Perform Loopback
- Perform start/stop/modify BERT
- Retrieve the results and/or current status of the BERT.
- Retrieve the Line Level Real Time Statistics.

Path Diagnostics

- Retrieve the Path Level Attributes such as Path Status etc.
- Perform Loopback
- Retrieve the Path Level Real Time Statistics.

Trunk Diagnostics

- Retrieve the Trunk Local and Remote End Real Time Statistics

IMA Group Diagnostics

- Retrieve the IMA Group Level Attributes such as IMA Group Status etc.
- Retrieve the accumulated delay on all the IMA Links under the IMA Group.
- Clear the accumulated delay on all the IMA Links under the IMA Group.
- Restart the IMA Group.
- Retrieve the IMA Group ATM Cell Layer Ingress/Egress Counters.
- Retrieve the IMA Group Level Real Time Statistics.

IMA Link Diagnostics

- Retrieve the IMA Link Level Attributes such as IMA Link Status etc.
- Start/Stop IMA Link Test
- Modify IMA Link Test Pattern
- Retrieve the IMA Link Level Real Time Statistics.

Connection Diagnostics

- Retrieve the Connection Level Attributes such as Connection Status etc.
- Retrieve the Local and Remote End Point Attributes such as A-bit, AIS, OAM etc.
- Retrieve the Local and Remote End Point Real Time Statistics.

The Diagnostics Server would interface with the CM Server to support the following Connection related Diagnostics Operations:

- Connection Loopback
- Up Connection
- Down Connection
- Connection Trace
- Test Connection
- Test Delay
- Test Connection Segment
- Test Ping OAM

This section includes the following information:

- C.10.1 Diagnostics Center Framework
- C.10.2 11.2 Diagnostic Server (DCServer) Specific Issues

C.10.1 Diagnostics Center Framework

This section includes the following information:

- C.10.1.1 Cannot Launch Diagnostic Center
- C.10.1.2 Cannot Launch Other Applications from Diagnostics Center
- C.10.1.3 Exception Raised When Diagnostics Center Is Launched
- C.10.1.4 Double Click Operation In Diagnostics Center Tree View Does not Launch An Internal Frame
- C.10.1.5 Drag and Drop Within Diagnostics Center
- C.10.1.6 DnD from/to Diagnostics Center to/from Other Applications
- C.10.1.7 Drop Target Displays Incorrect Object or Object Data
- C.10.1.8 Diagnostics Center Does Not Respond (GUI Is Grayed-Out)

C.10.1.1 Cannot Launch Diagnostic Center

The Diagnostics Center cannot be launched (main window will not appear) using one of the following methods:

- Click the Diagnostics Center icon from the Launch Center or from any application.
- Choose Tools > Diagnostics Center from any application.
- Right-click the selected node from the Hierarchical Tree, and choose Diagnostics Center.

Step 1 Check diagcenter.jar file under /opt/svplus/java/jars/cwm directory.

Defect Information—Collect the following information for further analysis:

1. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
2. Collect screen snapshots. In particular, error/information message dialog boxes.

3. Collect cmsvr.log file under the /opt/svplus/log directory.
4. Collect DCSserver.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.2 Cannot Launch Other Applications from Diagnostics Center

The Diagnostics Center cannot launch other applications using one of the following methods:

- Choose the target application under the Tools menu item.
- Right-click on the selected object from the Hierarchical Tree, and choose target application.

Step 1 Check the target application jar file

Make sure the target application jar file exists under the /opt/svplus/java/jars/cwm directory on the target machine

Defect Information—Collect the following information for further analysis:

1. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
2. Collect screen snapshots. In particular, error/information message dialog boxes.
3. Collect cmsvr.log file under the /opt/svplus/log directory.
4. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.3 Exception Raised When Diagnostics Center Is Launched

When the Diagnostics Center is launched, using one of the methods described above, an exception is raised and the Java Console shows the exception trace information.

Defect Information—Collect the following information for further analysis:

1. Collect Java Console information.
2. Collect CMSCclient.log file under the D:\Documents and Settings\\<username>\log directory
3. Collect screen snapshots. In particular, error/information message dialog boxes.
4. Collect cmsvr.log file under the /opt/svplus/log directory.
5. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.4 Double Click Operation In Diagnostics Center Tree View Does not Launch An Internal Frame

Double click on an object in Diagnostics Center Tree View does not launch an internal frame in the content window to open the object in the context pane (Internal Frame).

Defect Information—Collect the following information for further analysis:

1. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
2. Collect Java Console information

3. Collect screen snapshots. In particular, error/information message dialog boxes.
4. Collect cmsvr.log file under the /opt/svplus/log directory.
5. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.5 Drag and Drop Within Diagnostics Center

The Drag and Drop (DnD) of a network element from the Diagnostics Center Tree View to the content pane (a) fails to open an internal frame or recycle the contents of an existing frame to display the object's attributes or (b) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine that the DnD operation is supported for the dropped object

The following objects can be dropped from the Tree View to the Diagnostics Center content pane; For the 'Element Tab', the Network, Node, Card, Line, Port, IMA, IMA links objects are supported and 'Folder' objects are not supported. For 'connection tab', the Node, Card, Line, Port objects are supported and 'Folder', IMA and IMA link objects are not supported.

Defect Information—The following log files need to be collected:

1. Collect the following information for further analysis:
2. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
3. Collect screen snapshots. In particular, error/information message dialog boxes.
4. Collect cmsvr.log file under the /opt/svplus/log directory.
5. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.6 DnD from/to Diagnostics Center to/from Other Applications

As drag source, the DnD of an object from Diagnostics Center to another Cisco MGM application fails to display the selected object in the target application.

As a drop target, the DnD from another CMSC application to the Diagnostic Center's content pane (a) fails to open an internal frame or recycle the contents of an existing frame to display the dropped object's attributes or (b) results in the 'Operation Not Supported' message dialog box.

Step 1 Determine the DnD operation is supported for the selected object

Determine that the target application supports the DnD operation for the dropped object.

Step 2 Java VM

Determine that the source and the target application belong to the same instance of the Java VM. CMSC framework does not support DnD operations across applications belonging to different JVMs.

Defect Information—Collect the following information for further analysis:

1. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory
2. Collect cmsvr.log file under the /opt/svplus/log directory.
3. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.7 Drop Target Displays Incorrect Object or Object Data

The Diagnostic Center's internal frame opens successfully but displays either information related to another object or the dropped object attribute values are not correct.

Defect Information—Collect the following information for further analysis:

1. Collect CMSCclient.log file under the D:\Documents and Settings\username\log directory.
2. Collect screen snapshots. In particular, error/information message dialog boxes.
3. Collect cmsvr.log file under the /opt/svplus/log directory.
4. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.1.8 Diagnostics Center Does Not Respond (GUI Is Grayed-Out)

The Diagnostics Center does not respond and the GUI is grayed-out.

Step 1 Check if Java DOS Window is already enabled.

1. Launch the WebStart Application
2. Click on File->Preferences
3. Select the Java tab
4. For the selected Java entry, check the 'Command' column entry (If need be, expand the column display all information) to determine if it is set to 'javaw.exe' or 'java.exe'.
5. If the 'Command' column settings is set to'java.exe', then the Java DOS Window is already enabled and a DOS Window task should be running on the machine. Otherwise, the Java DOS Window is not enabled ('Command' column entry is set to'javaw.exe').

Step 2 If Java DOS Window is already enabled, then proceed to the 'Defect Information' section to collect data.

Step 3 If Java DOS Window is not enabled, then the current log information might not be sufficient to determine the root cause.

a. Collect currently available log information.

b. Enable the Java DOS Window.

Enable the Java DOS Window by changing the'javaw.exe' to'java.exe'.

c. Verify that the WebStart/Java DOS is enabled.

Use PC Client to launch a CMSC GUI application and verifying that a DOS box is launched.

d. step 3-5: Try to reproduce the problem in order to collect additional Java related data using WebStart/Java DOS Window.

Defect Information—Collect the following information for further analysis:

1. Collect Java DOS Window data:
2. Select the Java DOS box.
3. Issue a 'Ctrl and Break' command. Hold the 'Ctrl' key down and click on the 'Break' (Pause) key.
4. This action should result in the DOS showing Java thread related information.
5. Copy the data to a log file for further analysis.
6. Collect CMSCclient.log file under the D:\Documents and Settings\<username>\log directory
7. Collect screen snapshots. In particular, error/information message dialog boxes.
8. Collect cmsvr.log file under the /opt/svplus/log directory.
9. Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.2 11.2 Diagnostic Server (DCServer) Specific Issues

This section includes the following information:

- C.10.2.1 XML Parser Error
- C.10.2.2 SNMPCOMM_TIMEOUT Error While Polling mib Objects
- C.10.2.3 Node Syncup Status Are Not Shown in the Diagnostic Center GUI
- C.10.2.4 Node Resync Fails
- C.10.2.5 Polling of Real Time Counters Fails
- C.10.2.6 Some Real Time Counters Are Not Shown
- C.10.2.7 Unable to Start/Stop/Modify BERT Operations
- C.10.2.8 Unable to Start/Stop IMA Link Test Patterns
- C.10.2.9 Cannot Perform Connection Diagnostics
- C.10.2.10 Miscellaneous Issues / Problems in Diagnostics Center

C.10.2.1 XML Parser Error

XML Parsing error is seen while launching Diagnostics Center GUI (either by drag and drop method or right-lick method) for a network element. The pop-up window says "Internal Error: XML Parsing Error" and looks like the picture shown below:

Step 1 Check if the entity (Node / Card / Line / Port etc) which resulted in this error is supported in the Cisco MGM version being used.

If this error is seen for a supported node/card go to step 2.

Step 2 Open /opt/svplus/log/DCServer.log file and look for the message information when this error occurred

a. A typical message in the log looks like this: ERR: Fatal Error at file, line 0, char 0, Message: An exception occurred! Type:RuntimeException, Message:The primary document entity could not be opened. Id=/opt/svplus/xml/diagcenter/XXX/XXX-XXX.xml (<someNumber>: <x>) <someTimeStamp> ERR: InternalError: XML Parsing Error

b. If the .xml file name mentioned above has two consecutive hyphens (example: ABC--XYZ.xml), or if it has a preceding hyphen (example: -ABC.xml) or terminates with hyphen before the file extension (example: ABC-.xml) proceed to step 3, where investigating incorrectly formatted XML file names is discussed

c. Check if the .xml mentioned in the log message (as shown in the above step) exists under /opt/svplus/xml/diagcenter directory. If it does not exist, contact Cisco MGM Engineers with the Defect Information.

Step 3 This step is to investigate incorrectly formed XML file name strings. As a first note, the format of XML file names is <Platform>-<Card>-<InterfaceType>-<SomeEntityName>.xml. This format is generic with a few exceptions. Also note that Platform, InterfaceType are optional and will not be seen for many files (example: ABC-Card.xml is a valid XML file name).

a. If the Platform part of the XML file name is incorrect/missing, check the NODE table to see if it is correctly populated.

b. If the Card part of the XML file name is incorrect/missing, check the CARD table to verify if it is correctly populated.

c. If the InterfaceType part of the XML file name is incorrect/missing, check the appropriate table to verify if it is correctly populated.This table generally corresponds with the line/port table of the card for which this error is noticed.

d. If the EntityName part of the XML file name is incorrect, contact Cisco MGM Engineers, with the Defect Information required (as given below).

Defect Information—Collect the following information for further analysis:

1. Collect all, complete screen snapshots for the investigative commands used for debugging this issue.
2. DCServer.log file from the log directory.

Possible alternative workaround—None

C.10.2.2 SNMPCOMM_TIMEOUT Error While Polling mib Objects

The Diagnostics Center GUI shows an SNMP Timeout error when polling real time counters.

Step 1 Check the status of the node.

Step 2 If the node is reachable then check whether the community strings are set properly.

Step 3 Check in the DCServer.log file whether the community string used for querying the objects is set correctly.

Step 4 Check whether the query has been sent to the switch.

Defect Information—Collect the following information for further analysis:

- Collect CMSClient.log file under the D:\Documents and Settings\username\log directory.
- Collect DCServer.log file under the /opt/svplus/log directory.

Possible alternative workaround—None

C.10.2.3 Node Syncup Status Are Not Shown in the Diagnostic Center GUI

When Diagnostic Center is launched for a network element, the GUI does not show the Node syncup status for all the nodes in the network.

Step 1 Run "selnd" as svplus and check the status of all the nodes. If they are not shown properly then there should be some problem with the EM process. Check the EM logs.

Step 2 Check the node table entries for all the nodes.

Defect Information—Collect the following information for further analysis:

- node table entry for the corresponding node.
- DCServer.log file from the log directory.

Possible alternative workaround—None

C.10.2.4 Node Resync Fails

Node resync fails from Diagnostic Center.

Step 1 Check whether the node is reachable.

Step 2 Check for any exceptions in the DCServer.log file.

Defect Information—Collect the following information for further analysis:

- node table entry for the corresponding node.
- DCServer.log file from the log directory.
- emd.log from the log directory.

Possible alternative workaround—None

C.10.2.5 Polling of Real Time Counters Fails

Unable to poll Realtime counters from DC GUI

Step 1 Check whether the node is reachable and the community strings are set correctly.

Step 2 Check whether those objects are applicable. Check any appropriate commands from CLI.

Step 3 Use any snmp tool and check whether the mib objects are retrievable.

Step 4 Narrow down the problem by selecting one counter at a time and find out for what all counters the polling fails.

Defect Information—Collect the following information for further analysis:

- Collect the DCServer.log file from /opt/svplus/log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- CLI output of dspcd <slot No> for that card. Output of any appropriate CLI commands used.
- If step 4 was performed, provide the list of counters for which polling failed.

Possible alternative workaround—Use CLI to monitor the real time counters.

C.10.2.6 Some Real Time Counters Are Not Shown

Some Real Time counters are missing from DC GUI

Step 1 Check whether the counters are applicable to that card (version/mode if applicable).

Step 2 Check any appropriate commands from CLI.

Step 3 Use any snmp tool and check whether the mib objects are retrievable.

Defect Information—Collect the following information for further analysis:

- Collect the DCServer.log file from /opt/svplus/log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.
- CLI output of dspcd <slot No> of the card.
- Provide the list of missing counters for the particular node / card.

Possible alternative workaround—Use CLI to get the real time counter values.

C.10.2.7 Unable to Start/Stop/Modify BERT Operations

Unable to start/stop/modify BERT operations from DC GUI

Step 1 Check whether the node is reachable and the community strings are set correctly.

Step 2 Check whether the card is in Active state.

Step 3 Check whether correct varbinds are sent for snmpset.

Step 4 Check whether the options set for start/stop/modify BERT are applicable.

Step 5 Check whether BERT operations are successful in CLI with the options chosen from DC GUI.

Step 6 GUI sends only the mandatory and modified values to the DC server for snmpset. Use any snmptool with these values alone and do BERT operation. If it succeeds, then there is some problem with the Diagnostic Center.

Defect Information—Collect the following information for further analysis:

- Collect the DCServer.log file from /opt/svplus/log directory.
- Collect screen snapshots. In particular, the DC GUI BERT window, error/information message dialog boxes.

Possible alternative workaround—Use CLI/DiagProxy for BERT operations.

C.10.2.8 Unable to Start/Stop IMA Link Test Patterns

Unable to start/stop/modify IMA Link Test pattern from DC GUI

Step 1 Check whether the node is reachable and the community strings are set correctly.

Step 2 Check whether the card is in Active state.

Step 3 Check whether correct varbinds are sent for snmpset.

Step 4 Check whether the IMA Link Test pattern can be performed from the CLI.

Step 5 Use any snmptool and try to set the objects shown in the DCServer.log file.

Defect Information—Collect the following information for further analysis:

- Collect the DCServer.log file from /opt/svplus/log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.

Possible alternative workaround—Use CLI for IMA Link test patterns operations.

C.10.2.9 Cannot Perform Connection Diagnostics

Unable to perform connection diagnostics from DC GUI. The connection diagnostics are performed through the CM Server application. Diagnostics Server forwards all the connection diagnostics requests to the CM Server. If there are any connection diagnostics errors, it is more likely to be in the CM Server application.

Step 1 Check whether the Sync Up is complete.

Step 2 Check whether the node is reachable and the community strings are set correctly.

Step 3 Check whether the card is in Active state.

Step 4 Check whether correct varbinds are sent for snmpset.

Step 5 Check for any specific exceptions in the DCServer.log file.

Step 6 If there are no exceptions in the DCServer.log file then the problem could be from the Connection Manager front.

Defect Information—Collect the following information for further analysis:

- Collect the DCServer.log and cmsvr.log files from /opt/svplus/log directory.
- Collect screen snapshots. In particular, error/information message dialog boxes.

Possible alternative workaround—Use CLI/ SNMP Conn Proxy for connection diagnostics.

C.10.2.10 Miscellaneous Issues / Problems in Diagnostics Center

If you encounter any other issues/problems not listed above, contact the Cisco MGM Engineers with the Defect Information.

Step 1 Check whether the similar operation could be performed successfully through the CLI.

Defect Information—Collect the following information for further analysis:

- Describe the operation during which the problem/issue was encountered.
- Collect the DCServer.log and cmsvr.log files from /opt/svplus/log directory.
- Collect all the screen snapshots.
- Collect the CLI dump of this operation if applicable.

Possible alternative workaround—None

C.11 Performance Management Collection and Parsing Problems

PM collection is done on the entire node and statistics files are uploaded from all applicable cards on that node

Stats Parser parses these statistics files and stores the stats data in the database.

This section includes the following information:

- C.11.1 PM Collection Issues
- C.11.2 PM Parsing Issues

C.11.1 PM Collection Issues

This section includes the following information:

- C.11.1.1 pmcollector—Generic Troubleshooting
- C.11.1.2 PM Collection Fails for the Node - Logfile Shows "Node not discovered"
- C.11.1.3 PM Collection Fails for the Node - Logfile Shows "Card not discovered"
- C.11.1.4 PM Collection Fails for the Node - Logfile Shows "Time not synchronized"

- C.11.1.5 PM Collection Fails for the Node - Logfile Shows "Snmp failed"
- C.11.1.6 PM Collection Fails for the Node - Logfile Shows "Ftp failed"
- C.11.1.7 PM Collection Fails for the Node - Logfile Shows "Polling failed and wait for major retry" or "Major retry failed and wait for critical retry" or "Critical retry failed and wait for history retry" or "History retry failed and wait for next retry" or "No more retry"

C.11.1.1 pmcollector—Generic Troubleshooting

When performing generic troubleshooting, always check the following:

* If pmcollector process is running - run 'psg pmcollector' and check if you get a result.

* Make sure the stats files come to /opt/svplus/purge directory of the Cisco MGM. Check for all stats files, there should not be any missing file. There should be no files accumulated in /opt/svplus/spool directory.

* Check the file_err_log table for any failure of collection of file.

* Check the collsvr_err_log table for any failure during start/stop collection

* Check the coll_err_log table for entire collection server errors.

* Check the '/opt/svplus/cache/scm/scmcollout.log' for stats file request being done.

* Check the '/opt/svplus/cache/scm/scmcollin.log' for stats file been collected or not.

* Check the '/opt/svplus/cache/scm/scmcollout.log' for stats file collection errors.

C.11.1.2 PM Collection Fails for the Node - Logfile Shows "Node not discovered"

This can happen when the node is not in mode

Check the node_info table - echo "select node_not_discovered from node_info where node_id=<node_id> and slot=<slot>" | dbaccess

If the node_not_discovered is set to 1 means, node is not discovered.

Check the state of the Node. For that node-name - run the following command - echo "select * from node where node_name = '<node-name>' " | dbaccess

Check the mode of the node in the output - the mode must be 3.

Defect Information—Collect the following information for further analysis:

- pmcollector.log, output of 'selnd' or output of - echo "select * from node where node_name = '<node-name>' " | dbaccess
- Related key index entries
- pmcollector

Workaround

If the node is not mode 3, lookup troubleshooting for EM module.

C.11.1.3 PM Collection Fails for the Node - Logfile Shows "Card not discovered"

This can happen when the card is not in the active state.

Check the node_info table - echo "select card_not_discovered from node_info where node_id=<node_id> and slot=<slot>" | dbaccess

If the card_not_discovered is set to 1 means, card is not discovered

Check the card table - echo "select fc_state, fc_type, slot from card where node_id = <node-id> and slot = <slot-num> " | dbaccess.

The fc_state of the card must be 3

Defect Information—Collect the following information for further analysis:

- pmcollector.log, output of - echo "select fc_state, fc_type, slot from card where node_id = <node-id> and slot = <slot-num> " | dbaccess.
- Related key index entries
- pmcollector

Workaround—If the card is not in fc_state 3, lookup troubleshooting for EM module.

C.11.1.4 PM Collection Fails for the Node - Logfile Shows "Time not synchronized"

This can happen when the timestamp between the Cisco MGM and the Collector is not synchronized or the timestamp between collector and node is not synchronized.

Check the sync_info table - echo "select offset from sync_info where sync_node_id=<node_id>" | dbaccess

Check the time on the Cisco MGM/Collector and on the node and make sure the offset got from above query is the difference of time in seconds.

In case of feeders, check the time difference between Cisco MGM and the routing node of the feeder.

Defect Information—Collect the following information for further analysis:

- pmcollector.log
- Related key index entries
- pmcollector

Workaround—Set the time on the Cisco MGM/Collector and the node to the same timestamp.

C.11.1.5 PM Collection Fails for the Node - Logfile Shows "Snmp failed"

This can happen due snmp failure due to wrong community string or due to timeout.

Check the node_info table to check the get_str, set_str and make sure they are the one on the node. Check the snmp community strings on the node using the 'dspsnmp'.

check the log files for more detailed error, grep "snmp" scm*, if it is timeout error, change the timeout setting and retry setting in /opt/svplus/config/pmcollector.conf

Defect Information—Collect the following information for further analysis:

- pmcollector.log
- Related key index entries
- pmcollector, manual snmp results

Workaround—If the community strings are different on Cisco MGM and node, lookup troubleshooting for Topology module

C.11.1.6 PM Collection Fails for the Node - Logfile Shows "Ftp failed"

This could happen for various reasons, generally because of wrong user/password or due to timeout.

Check the node_info table to check the node_id, node_name, ipaddress and make sure they are the correct one.

Check the type of ip routing used while starting collection and for that ip routing check if the ip address is reachable/valid.

Check the ftp_user_name and ftp_user_passwd in the coll_info table and the ftp_user_name and ftp_user_passwd in the node_info table of stratacom database are matching and are valid.

Defect Information—Collect the following information for further analysis:

- pmcollector.log, dump of coll_info table, dump of node_info table of stratacom.
- Related key index entries
- pmcollector

Workaround—Use the atm or lan ip which is reachable.

C.11.1.7 PM Collection Fails for the Node - Logfile Shows "Polling failed and wait for major retry" or "Major retry failed and wait for critical retry" or "Critical retry failed and wait for history retry" or "History retry failed and wait for next retry" or "No more retry"

This could happen for various reasons, mainly due to ftp/tftp failures.

Check the node reachable[pingable] with nw_ip_address or lan_ip_address.

If only the nw_ip_address is reachable and the lan_ip_address is unreachable, then make sure the 'IP Routing' for stats collection is using the 'In Band'.

If only the lan_ip_address is reachable and the nw_ip_address is not reachable, then make sure the 'IP Routing' for stats collection is using the 'Out of Band'.

Use 'dspifip' command to check the lan_ip_address and nw_ip_address

Check the pmcollector.log, whether we are using the correct ip_address or not for stats collection.

Check for the existence of connections on the slot, for which, we are collecting the stats. Also check for the stats Flag. Use command 'sumDBShow' or 'sfmDBShow' on the node.

Check the ftp_user_name and ftp_user_passwd in the coll_info table and the ftp_user_name and ftp_user_passwd in the node_info table of stratacom database are matching and are valid.

Defect information—Collect the following information for further analysis:

- pmcollector.log, dump of node_info and coll_info.
- Related key index entries
- pmcollector

Workaround—Use the atm or lan ip which is reachable.

C.11.2 PM Parsing Issues

This section includes the following information:

- C.11.2.1 StatsParser—Generic Troubleshooting
- C.11.2.2 StatsParser—Files Are Parsed But the Files Are Listed in the BadFileList

C.11.2.1 StatsParser—Generic Troubleshooting

StatsParser reads the data from the stat files and inserts the data into the database.

When performing generic troubleshooting, always check the following:

* If statsparser process is running - run 'psg statsparser' and check if you get a result.

* Log level for the statsparser can be increased by editing the config file.

- Edit the ~/config/statsparser.conf and change the LOG_LEVEL field to 7.

C.11.2.2 StatsParser—Files Are Parsed But the Files Are Listed in the BadFileList

While parsing the stats files and inserting the data into the database, if the StatsParser encounters a problem with the parsing of data in the stats file or a problem with the format of the file, the file be put in the BadFileList.

- Node entry not available in the scmnode table. Perform the following query and verify that

* all the nodes that are under collection state are listed in the output.Also verify that the

* entries of the nodes are not duplicated. The query is

% echo " SELECT * from scmnode" | dbaccess

- File is corrupted. Read the file manually using the statsreader.

Usage is % statsreader < stats file name >

If the out put doesn't look normal or the file looks corrupted, then the problem would most probably on the switch side. Report the problem to the Cisco MGM team and the switch team

- There is no more space left on the machine to insert any more data.

Report the problem immediately.

Defect Information—Collect the following information for further analysis:

- statsparser.log, output of df -k and mount
- Related key index entries
- BadfileList

C.12 Statistics Report Problems

This section includes the following information:

- C.12.1 Statistics Report
- C.12.2 If You Collected Data and You See No Data Available
- C.12.3 If You Generate Report and Don't See Data for a Long Time
- C.12.4 You See FDNs for Other Entities When You Generate Report
- C.12.5 You See Wrong FDN for Raw Report
- C.12.6 The Utilization Report Value Is Greater Than 100%

C.12.1 Statistics Report

You can use the Statistics Report to view reports of statistics data that are collected from the switch.

SRT GUI provides the user an ability to generate and view historical statistics reports. Reports like Raw statistics, Top Utilization are shown in table format and performance data reports are shown in graph and table format

C.12.2 If You Collected Data and You See No Data Available

If you started collection and you see no data available when generating raw reports

Step 1 Make sure the data is collected and parsed.

Step 2 Make sure the corresponding table as data for the specified time period

Defect Information—Collect the following information for further analysis:

- /opt/svplus/log/srtserver.log

Possible alternative workaround—None

C.12.3 If You Generate Report and Don't See Data for a Long Time

If you are trying to generate reports and you don't see any data for a long time and you only see the message Retrieving data.

Step 1 Check srtserver.log for any errors messages.

Defect Information—Collect the following information for further analysis:

- /opt/svplus/log/srtserver.log

Possible alternative workaround—None

C.12.4 You See FDNs for Other Entities When You Generate Report

You see FDNs for other entites when you generate reports. For example: When you generate raw report for trunk data for one card, you might see trunk data from different card also. This is because some of the tables doesn't have slot information and hence we get data only with node information

Step 1 This is not an error. You will see extra data

Defect Information—Collect the following information for further analysis:

- /opt/svplus/log/srtserver.log

Possible alternative workaround—None

C.12.5 You See Wrong FDN for Raw Report

The FDN reported is wrong. Either with wrong values or with junk values

Step 1 The data should be correct. This is an error in the server while forming FDN

Defect Information—Collect the following information for further analysis:

- /opt/svplus/log/srtserver.log

Possible alternative workaround—None

C.12.6 The Utilization Report Value Is Greater Than 100%

The Utilization report value is greater than 100%.

Step 1 This is an error. Collect the log file mentioned below

Defect Information—Collect the following information for further analysis:

- /opt/svplus/log/srtserver.log

Possible alternative workaround—None

C.13 Service Agent Problems

RtmProxy is the only component in Service agent that is used in Cisco MGM. Service Agent processes user request through SNMP and convey to switch agent and finally return the result to user.

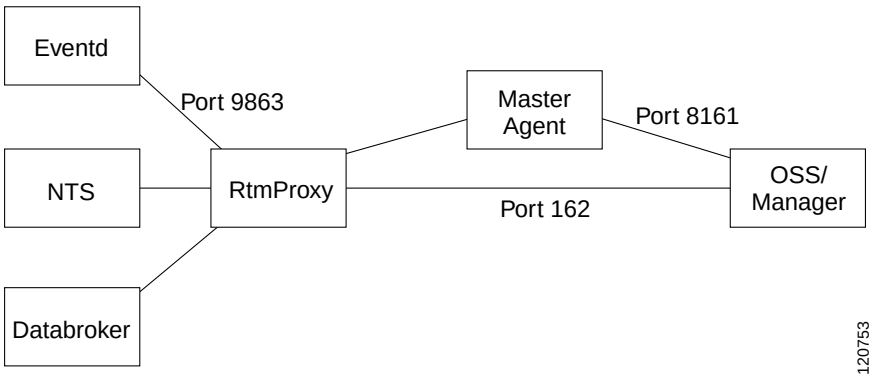
This section includes the following information:

- C.13.1 RtmProxy

C.13.1 RtmProxy

RtmProxy is Cisco MGM's northbound SNMP interface to provide traps from all switches to the customer applications. It is an interface with which the customer application registers for traps.The customer application use snmp to register with RtmProxy. Figure C-7 gives the flow of information.

Figure C-7 RTMProxy



The OSS/Manager send snmp request to port 8161 of the Cisco MGM machine. In this request they specify the port on which they are listening for traps. In the above example, the manager will be sent traps on port 162. The registration, de-registration and other such scripts can be found at /opt/svplus/scripts/proxyscripts/rtmproxy on a Cisco MGM machine. These scripts can be used as reference for registration and de-registration with RtmProxy. These scripts are meant only for internal use.

This section includes the following information:

- C.13.1.1 Registration with RtmProxy Failed
- C.13.1.2 Not Receiving Any Traps
- C.13.1.3 Manager Gets Deregistered
- C.13.1.4 Nodal Community Strings Do Not Work

C.13.1.1 Registration with RtmProxy Failed

Manager's snmp request to register with RtmProxy returned an error.

Step 1 Verify that the Cisco MGM core is up and running. This can be verified by doing ps -ef | grep RtmProxy on the Cisco MGM machine.

Step 2 Verify that the snmpset request was sent to port 8161.

Step 3 Verify that the community string for the snmpset is set to private

Step 4 Verify that the mib objects that are being set are correct.

The mib objects that should be set for the manager's registration are

stratacom.rtm.trapsConfig.trapConfigTable.trapConfigEntry.managerRowStatus

mstratacom.rtm.trapsConfig.trapConfigTable.trapConfigEntry.trapFilterRegisterCategory

stratacom.rtm.trapsConfig.trapConfigTable.trapConfigEntry.managerPortNumber

Step 5 Verify that the ip address to which you are sending the snmpset request is correct

Defect Information—Collect the following information for further analysis:

- Collect RtmProxy.log* and snmpd.log*

Possible alternative workaround—None

C.13.1.2 Not Receiving Any Traps

Traps are not being received on the port with which the manager registered.

Step 1 Verify that the registration with RtmProxy went through successfully. If the registration did not go through, seeC.13.1.1 Registration with RtmProxy Failed.

Step 2 Verify the port number that RtmProxy is sending traps to is the same as the port number on which the trap receive utility or manager is listening. This can be done by

tballraker29% /opt/OV/bin/snmpget -d -v1 -p8161 -t 3000 -r 0 -cpublic 172.28.131.137 stratacom.rtm.trapsConfig.trapConfigTable.trapConfigEntry.managerPortNumber.172.28.131.158

where 172.28.131.137 is the Cisco MGM IP Address and

172.28.131.158 is the Manager IP Address (or IP Address of the station where the trap receive utility is running)

Step 3 Verify that the manager is still registered with RtmProxy. This can be done by doing

tballraker29% /opt/OV/bin/snmpget -d -v1 -p8161 -t 3000 -r 0 -cpublic 172.28.131.137 stratacom.rtm.trapsConfig.trapConfigTable.trapConfigEntry.managerRowStatus.172.28.131.158

where 172.28.131.137 is the Cisco MGM IP Address and

172.28.131.158 is the Manager IP Address (or IP Address of the station where the trap receive utility is running)

The snmp should return 1.

Defect Information—Collect the following information for further analysis:

- Collect the RtmProxy.log* and snmpd.log*

Possible alternative workaround—Re-register with RtmProxy.

C.13.1.3 Manager Gets Deregistered

The Manager keeps getting de-registered from RtmProxy after a while

Step 1 Verify that the Keep Alive script is running. The manager will automatically get de-registered if no snmp is done on any of the tables in RtmProxy. To keep the manager registered with RtmProxy, run the keep alive script in the background, as follows:

```
#!/bin/sh
Usage="$0 <Agent Ip Address> <Manager IP address>"
if [ $# -lt 2 ]
then
echo "Usage :$Usage"
exit 1
fi
managerRowStatus=.1.3.6.1.4.1.351.120.1.1.1.3
managerPortNumber=.1.3.6.1.4.1.351.120.1.1.1.2
lastseq=.1.3.6.1.4.1.351.120.1.3.0
while true
do
sleep 60
CMD="/opt/OV/bin/snmpget -cpublic -p8161 -t3000 -r0 $1 $managerRowStatus.$2 $lastseq"
echo $CMD
$CMD
done
exit 0
```

Step 2 Verify that ip reachablity is not lost of the Cisco MGM station from the station where the manager is running.

Defect Information—Collect the following information for further analysis:

- Collect the RtmProxy.log* and snmpd.log*

Possible alternative workaround—Re-register the manager with RtmProxy

C.13.1.4 Nodal Community Strings Do Not Work

Snmpwalk using the nodal community strings returns error

Step 1 Verify that the snmp request is being issues to port 8161.

Step 2 Verify that the community string is correct.

Defect Information—Collect the following information for further analysis:

- Collect the RtmProxy.log* and snmpd.log*

Possible alternative workaround—None

C.14 Audit Trail Log Problems

This section includes the following information:

- C.14.1 Audit Trail Logging Mechanism

C.14.1 Audit Trail Logging Mechanism

This provides Cisco MGM with the ability to record user activities across different modules in a persistent file. All Cisco MGM Java front GUI application will send the information of user activities to Audit Logger server via CORBA interface. Audit Logger server, then, will write the data into the persistent log file.

This section includes the following information:

- C.14.1.1 AuditLogger.conf Usage
- C.14.1.2 Audit Trail Log File Naming Convention
- C.14.1.3 Open a Dialog Box in a Cisco MGM GUI, There Is No Record in the Audit Trail Log File

C.14.1.1 AuditLogger.conf Usage

The following can be configured in the configuration file:

Location of the log file - The default is (/opt/svplus/log/AL).

Number of days - By defining the number of days for the audit trail log files to be kept, all other obsoleted audit trail logs will be deleted automatically.

The name of the user group whose member can read the audit trail log files - it is a standard UNIX user group.

C.14.1.2 Audit Trail Log File Naming Convention

There is one audit trail log file per day. The file name convention is defined as: AuditTrail.<mmddyyyy>.log

Example audit trail log files: AuditTrail.10102001.log for October 10, 2001.

C.14.1.3 Open a Dialog Box in a Cisco MGM GUI, There Is No Record in the Audit Trail Log File

Open a dialog box in a Cisco MGM GUI.There is no open window event for this dialog box logged in the Audit Trail log file.

The detailed step by step debugging for the above is as follows:

Step 1 Open Cisco MGM Security Manager GUI, check the Audit-Read permission for that Cisco MGM GUI in the security profile associated with that particular user.

a. If the Audit-Read permission is not turned on, then no record is the expected behavior. Otherwise, go to step 2.

Step 2 Check if the Audit Logger server is running.

a. Use "psg AuditLogger" on the Cisco MGM machine. If no AuditLogger server is running, here is the problem. Then go to defect information, follow the steps to collect all the information needed.

Step 3 Check if any CORBA related exception thrown on the console.

a. If so, collect those error messages and/or call stacks.

Defect Information—Collect the following information for further analysis:

- Collect all, complete screen snapshots of the Cisco MGM GUI.
- Collect all the errors/exceptions thrown on the console, if any.
- Collect log: /opt/svplus/log/AuditLogger.log*, /opt/svplus/log/LogServer.log*, AuditTrail*.log (file location is set in /opt/svplus/config/AuditLogger.conf), /opt/svplus/log/watchdog.log.
- Collect all the core dump files in /opt/svplus/corefilesdir, especially for those AuditLogger core dump files.

C.15 Miscellaneous Problems

This section includes the following information:

- C.15.1 NTS
- C.15.2 Data Inconsistency
- C.15.3 Cisco MGM FTP Daemon

C.15.1 NTS

This section includes the following information:

- C.15.1.1 Nodes Stay in Mode 1 After Cold Start
- C.15.1.2 Config Change or Provisioning Activity Not Reflected on Cisco MGM
- C.15.1.3 How To Interpret NTS Log

C.15.1.1 Nodes Stay in Mode 1 After Cold Start

The NTS cannot manage a particular switch successfully. In other words, NTS declared the switch to be in the "Unreachable" or "Unregistered" state. As a result, NTS notified its clients with a LINK_DOWN message. NTS declares a node to be in OK state if it is in the trap manager list of the node and can successfully perform SNMP operations on the node.

Step 1 Check the PING reachability. Run "ntsControl" and enter "ni" at the prompt. Then, enter "q" to exit ntsControl. This shows the NTS node information. A node has to be in OK state so that Cisco MGM can start syncing it up. If the node is not in OK state, first thing to check is PING. Run "ping <ip_address>". If the PING succeeded, go to Step 2. Otherwise, fix the network reachability between the switch and the Cisco MGM station.

Step 2 Check the Cisco MGM IP address configuration This only applies to Cisco MGM workstation with multiple IP interfaces. The NMS_IP_ADDRESS setting in /opt/svplus/config/svplus.conf has to match the interface users chose for Cisco MGM. To check the IP interfaces, run "ifconfig -a". Cisco MGM stations with only one IP interface does not need to have the NMS_IP_ADDRESS setting.

Step 3 Check the Trap Manager List on the switch. SSH or Telnet to the switch. Run "dsptrapmgr" command to show the trap manager list. Check whether the Cisco MGM is in the table. If so, go to Step. 4. Otherwise, if the table is already full, remove unwanted entries with "deltrapmgr" command. The NTS should be able to register the Cisco MGM into the table within a few minutes. If not, go to Step. 4.

Step 4 Check the SNMP community strings. In case the SNMP Community String on the switch has been changed from the default setting, the SNMP Community Strings on the Cisco MGM have to match the new ones on the switch. The SNMP Community Strings on the switch can be viewed with "dspsnmp" command. The setting on the Cisco MGM can be viewed in Domain Explorer.

Defect Information—Collect the following information for further analysis:

- Save the output of "selnd", "dbnds", nts log and EM log of the node in question. < see EM log section>

Possible alternative workaround—If community strings do not match, run the Cisco MGM Configurator GUI to correct them. (/opt/svplus/java/bin/runConfigurator)

Related key index entries: nts, traps

C.15.1.2 Config Change or Provisioning Activity Not Reflected on Cisco MGM

The NTS does not receive any traps from a particular switch when it actually had generated traps.

Step 1 Check if the node is in OK state. If the ntsControl node information says the particular node is not in the OK state, see C.15.2.1 Connection Inconsistency Between the Switch and GUI. If the node is indeed in OK state, go to Step 2.

Step 2 Check the Trap IP address setting on the switch. The Trap IP address has to be the primary IP address of the switch. Otherwise, NTS cannot correlate the trap with the Cisco MGM node information and has to discard that trap. SSH or Telnet to the switch. The primary IP address can be found with "dspndparms" and then "dspifip" commands. Enter "dsptrapip" to see the current Trap IP address setting. Use "cnftrapip" to correct. See C.15.1.3 How To Interpret NTS Log.

Defect Information—None

Possible alternative workaround—None

Related key index entries: nts, traps

C.15.1.3 How To Interpret NTS Log

Locating a specific trap from a particular node in NTS log.

Step 1 Verify Trap Handling

NTS log has information about what are the traps delivered to a specific client. NTS by default keeps 20 old logs in addition to the current one. You can form your "grep" command with the key fields such as node id, trap number, client name and pid. For example:

```
( 21359: 63) 19:24:40 WARNING: N42 Trap(6, 50017, #15668881) to EMC-5-24596
```

The above line says NTS delivered Node 42 Trap 50017 Sequence Number 15668881 to EMC child 5 PID 24610.

In normal case, you see the following cluster for each trap in NTS log.

(21359: 46) 01:46:49 WARNING: N15 Trap(6, 60303, #25278)

(21359: 46) 01:46:49 WARNING: N15 Trap #25278 buffered

(21359: 48) 01:46:49 WARNING: N15 Trap(6, 60303, #25278) to CSA

(21359: 50) 01:46:49 WARNING: N15 Trap(6, 60303, #25278) to RtmProxy

(21359: 60) 01:46:49 WARNING: N15 Trap(6, 60303, #25278) to ooemc-24610

(21359: 58) 01:46:49 WARNING: N15 Trap(6, 60303, #25278) to EMD

(21359: 49) 01:46:49 WARNING: N15 Trap(6, 60303, #25278) to HPOV

line 1 means "Trap(6, 60303, #25278)" is received by NTS.

line 2 means it is successfully buffered by NTS.

line 3 ~ 7 means it is delivered to the clients who registered to receive it in their XML filter setting.

Step 2 If you cannot find the particular trap, verify if the switch is sending traps with a wrong trap IP address. If the switch trap IP is wrong, traps from it is declared as coming from unmanaged node and dropped. The Trap IP address has to be the primary IP address of the switch. Otherwise, NTS cannot correlate the trap with the Cisco MGM node information and has to discard that trap. See C.15.1.2 Config Change or Provisioning Activity Not Reflected on Cisco MGM.

The NTS prints a different message when a trap comes from a node it does not yet manage (unknown node_id), for example:

```
nts.7275.log.old.2:( 7275: 45) 03:32:39 WARNING: Trap unmanaged 172.28.140.16
```

In that case, it prints the IP address only and throw it away.

Defect Information—None

Possible alternative workarounds—None

Related key index entries: nts, log

C.15.2 Data Inconsistency

This section includes the following information:

- C.15.2.1 Connection Inconsistency Between the Switch and GUI
- C.15.2.2 Inconsistent Connection Status
- C.15.2.3 Inconsistent Connection Secondary Status
- C.15.2.4 Incomplete Connections

C.15.2.1 Connection Inconsistency Between the Switch and GUI

This section discusses strategies for debugging inconsistencies between the switch and the Cisco MGM GUI. The inconsistency in this section are not directly related to provisioning. The problems may be caused by coldstart, warmstart or provisioning, but they are noticed sometime after the fact. (i.e. You look at the system and suddenly realize there is an inconsistency).

This section will give a list of steps to try to determine more precisely the cause of the inconsistency. These steps should be performed in order.

1. Verify Node's Sync States
2. Isolate via Database Query
3. Isolate via Message Flow

Step 1 One common reason for inconsistency is nodes in a non-ok state after startup. This will result in connection counts being incorrect or the presence of incomplete connections.

a. Determine if sync-up has been completed.

b. If system has declared sync-up, verify that the nodes which you see inconsistency on are OK (in mode = 3). This can be done using the Cisco MGM CLI command "selnd" The second to last column identifies the mode for a given node.

Step 2 The information displayed on the connection manager GUI is taken directly from the user_connection table. The connection manager is rarely the problem. This section uses database access queries to help isolate the problem. If the problem is found in the user_connection table and the segment tables are incorrect, the problem is usually in EM. If the user_connection table is wrong but the segment tables are correct, we will need to continue with the investigation before we can determine a root cause.

Note All ports in the database and the messages are 0 based and all ports on the switch cli are 1 based. So if the switch said port 3, then you should query for port 2.

a. Query the user_connection table for one of the connections in question. For example, if the connection has a local endpoint of node=n, slot=s, logical_port= p, vpi/dlci = s1, vci = s2 then the query would look like this: "SELECT * from user_connection where l_node_id = n, l_slot = s, l_logical_port = p, l_subchnl_1 = s1, l_subchnl_2 = s2" If you are unsure which side is local and which is remote, try a query with both l_node_id = n and r_node_id = n (and slot, port etc.). If this row in the database is inconsistent with the switch, more investigation is required.

b. Verify that the databroker has received all traps from the EMs. To do this, view the columns inseg_tbl_2, inseg_tbl_2 and inseg_tbl_3. If the flag is set to '1' then all traps for the given segment have been received. These flags tell if the databroker received an add message for the given segment. If they are set to 0 it means the segment trap has not been processed by databroker. If the flag is set to 2 or 3, that means a only one end of the segment has been processed. (note that if the connection doesn't have 3 segments the non-used segments will be defaulted to '1')

c. We should now check the EM connection tables for the connections in question. <see EM section>

d. If we find that the segment tables are correct and the user_connection table is not, or if the inseg_tbl_x flags are not all = '1', we should continue with the testing from the next section. If we see that the segment tables are also incorrect, we should begin looking at the EM for debugging information.

Step 3 In some cases a more detailed review of the message flow between EM and DMD and sDbroker is necessary to determine the source of the error:

a. Verify that DMD received the message from EM. Search message log for the connection. This search is on the DMD first, followed by the sdbroker and xdbroker (xpvc only). The search is ether by connection object ID or node/slot/port/vpi/vci The DMD logs are checked, and if no messages are found then the OOEMC or other EM processes is checked. If the message is found, or the logs are incomplete, then we need to look deeper into the Databroker processes. If the DMD or the EM logs are complete and the message wasn't sent to DMD, then it is most likely an EM issue.

Find the dmd on interest by using the command /opt/svplus/dbcmap -d <node_id> the output will provide you with the dmd whose logs need to be queried.

grep "node <node_id> slot <slot #> .* port <logical_port> .* sCh1 <vpi or dlci> sCh2 <vci>" dmd<dmd_id #>Msg*

Each output line is similar to this:

```
( 7) 21:49:43 1058910582 MsgType=100 connObjId 65665 connStatus 1 secStatus 1
upperLevelAlrm0 oamStatus 0 channelNo -4272512 termination 1 masterFlag 0 wildCardFlag
0 controllerType 0 subType 55 lPercUtil 100 rPercUtil 100 persistentSlave 1
prefRouteId 0 directRouteFlag 0 Local node 11 slot 15 line -1 port 0 logPort 0 sCh1 1
sCh2 37 type 1 subType 0 nni -1 netprefix Remote node 11 slot 14 line -1 port 0
logPort 0 sCh1 32 sCh2 234 type 1 subType 0 nni 0 netprefix
```

Items of interest in the above example are:

21:49:43—time of event

Local node11 slot 15 .... sCh1 1 sCh2 37—This is the local endpoint

Remote node 11 ....—This is the remote endpoint.

MsgType=100—This is the message type of the message. The mapping is:

FEEDER_ADDUPD = 100,

MASTER_SPVC_ADDUPD = 101,

SLAVE_SPVC_ADDUPD = 102,

SINGLEENDSPVC_ADDUPD = 103,

PTOMPSPVC_ADDUPD = 104,

MASTER_PVC_ADDUPD = 105,

SLAVE_PVC_ADDUPD = 106,

MASTER_LOCALDAX_ADDUPD = 107,

SLAVE_LOCALDAX_ADDUPD = 108,

FEEDER_DEL = 109,

MASTER_SPVC_DEL = 110,

SLAVE_SPVC_DEL = 111,

SINGLEENDSPVC_DEL = 112,

SLAVE_SPVC_DEL = 111,

SINGLEENDSPVC_DEL = 112,

PTOMPSPVC_DEL = 113,

MASTER_PVC_DEL = 114,

SLAVE_PVC_DEL = 115,

MASTER_LOCALDAX_DEL = 116,

SLAVE_LOCALDAX_DEL = 117,

WILDCARD_DEL = 121,

grep conObjId xxxxxx dmd<dmd_id>Msg*".

grep "NotifyDataBroker> .*node x slot y .* sub1 v sub2 w" ooemc* < for more EM queries see section on EM>

b. If the DMD received the message but it is not reflected in the database. Identify which databroker module dropped the ball. First check the DMD to see if it forwarded the message. If it didn't check for the reason. The format may be wrong etc. one easy search/grep is node/slot/port/vpi/vci. This is output every time a cache query is done.

grep "DROP MSG: validation error" dmd<dmd_id>.<pid>.* - prints out dropped messages.

c. If the message made it to DMD, we need to see if the sdbroker received the message.

grep "node <node_id> slot <slot#> .* port <logical port> sCh1 <vpi/dlci> sCh2 <vci>" sdbroker*Msg*

d. If it looks like the message was received by the sdbroker but the database does not reflect the change, then we should verify if there is an inconsistency between the databroker Cache and the database. To dump the cache enter:

$ psg sdbroker - the process ID of the sdbroker will be returned

$ kill -USR1 <process id returned from the previous command>

The cache dump will be written to a file in /opt/svplus/log/sdbkrCache.dump Verify if the connection in question is correct in the cache.

Defect Information—We need the logs of the processes on both sides of the interface which the message was dropped. A dump of the specific user_connection table entry that is incorrect is also useful as well as the segment tables for this connection. The specific node, slot, logical_port, vpi, vci of both ends of the connection in question. If a cache dump was done, include that also.

Possible alternative workarounds—If the problem is between the sdbroker cache and the database, a cache resync can be done. TO do this execute the command /usr/usrs/svplus/tools/CacheResync [-t <time in seconds>]. If the problem still exists, collect the defect information.

Related key index entries: inconsistency, connection, databroker

C.15.2.2 Inconsistent Connection Status

The GUI display of 'Status' is from the 'state' field of the user_connection table. The field represents the worst condition of any of the segments in the connection. This field values are:

1 = clear

2 = fail

3 = Down

4 = incomplete

5 = Error

Step 1 If the value is not what is expected, check the connection level databases for each segment to see if they are correct.The last message on the segment in question is the important one.

Step 2 If the status is 'incomplete" it means that one of the segments of the connection is not in the user_connection table, check the "in_seg" flags in the user_connection table entry for this connection. Search the database and messages for the segment that has flag = 0. Also see next step on Error connection.

Step 3 If two master endpoints each have the same slave endpoint, then we have an errored connection. The first connection established will have a status of "error' and the second master endpoint connected to the slave will have a status of 'incomplete".

Defect Information: See C.15.2.1 Connection Inconsistency Between the Switch and GUI .

Possible alternative workaround—See C.15.2.1 Connection Inconsistency Between the Switch and GUI

Related key index entries: inconsistency, connection

C.15.2.3 Inconsistent Connection Secondary Status

The GUI display of 'Secondary Status' is from the 'Secondary_status' field of the user_connection table. The field represents the worst condition of any of the segments in the connection. This field is a bit map with each secondary status using 2 bits. The values of each status entry are

0 = unknown

1 = ok

2 = fail

The bit pattern is:

bits 1-2 local abit

bit 2,4 local ais

bit 5,6 local OAM

bit 7,8 local Conditioned

bit 9,10 remote abit

bit 11, 12 remote AIS

bit 13,14 remote OAM

bit 15, 16 remote Conditioned

Step 1 If the value is not what is expected, check the connection level databases for each segment to see if they are correct. See C.15.2.1 Connection Inconsistency Between the Switch and GUI . The last message on the segment in question is the important one.

Defect Information: See C.15.2.1 Connection Inconsistency Between the Switch and GUI .

Possible alternative workaround—See C.15.2.1 Connection Inconsistency Between the Switch and GUI

Related key index entries: inconsistency, connection

C.15.2.4 Incomplete Connections

A common issue is having 'to many' connections on a given card. This problem may be a result of incomplete connections. For example, if a feeder segment of a three-segment connection has not been processed by databroker, the incomplete connection would have an endpoint of a routing node, not the missing feeder. There would appear to be 'to many' connections on the routing node. A connection can be identified as incomplete if the 'state = 4' in the user_connection table

Step 1 Check the user_connection table for the number of segments and the inseg flags for the connection in question.

a. select num_segs, status, inseg_tbl_1, inseg_tbl_2, inseg_tbl_3 from user_connection where l_node_id = x and l_slot=y and l_port=z and l_subchnl_1 = v and l_subchnl_2 = w.

Defect Information—We need the logs of the processes on both sides of the interface which the message was dropped. A dump of the specific user_connection table entry that is incorrect is also useful. The specific node, slot, logical_port, vpi, vci of both ends of the connection in question.

Possible alternative workarounds—If the problem is between the sdbroker cache and the database, a cache resync can be done. TO do this execute the command /usr/usrs/svplus/tools/CacheResync [-t <time in seconds>]

Related key index entries: inconsistency, incomplete connection

C.15.3 Cisco MGM FTP Daemon

This section includes the following information:

- C.15.3.1 FTP Daemon Overview
- C.15.3.2 Generic Troubleshooting
- C.15.3.3 FTP Username and Password
- C.15.3.4 cwmftpd—Files Are Not Transferred Due to Wrong Username/Password
- C.15.3.5 cwmftpd—File Not Available On Switch
- C.15.3.6 FTP Sessions in Switch
- C.15.3.7 421 Session Limit Reached
- C.15.3.8 499 Session Limit Reached
- C.15.3.9 Acquiring a Session With Switch
- C.15.3.10 Failed to Acquire Session After All Retries
- C.15.3.11 General Log Information

C.15.3.1 FTP Daemon Overview

The cwmftpd process is an ILOG server that allows Cisco MGM modules to request a FTP put, get or directory listing service to and from network nodes or other Cisco MGMs. This server acts as an FTP client from FTP communication stand point and performs services similar to interactive "ftp" program.

The following processes use cwmftpd to ftp the files.

OOEMC

PM Collector

Related key index entries: ftp

C.15.3.2 Generic Troubleshooting

When performing generic troubleshooting, always check the following :

- Check whether 'cwmftpd' process is up and running.

```
psg cwmftpd
```

- Check the free disk space.

  ```
  df -k /opt/svplus
  ```

- Check whether target switch/MGM is reachable.
- Check for debug level. If logs are not giving detailed information, debug level can be increased by editing ~svplus/config/cwmftpd.conf.
- Set config parameter, LOG_LEVEL, to 7 to get detailed logs.

Related key index entries: ftp

C.15.3.3 FTP Username and Password

cwmftpd will use the node_info table of stratacom database to retrieve the ftp username and password. For SCM requests scmcollsvr sends the password along with the request.

Related key index entries: ftp, username, password

C.15.3.4 cwmftpd—Files Are Not Transferred Due to Wrong Username/Password

Files are not transferred between Cisco MGM and switch or between Cisco MGMs due to wrong username/password.

The files are not ftp'd between switch and Cisco MGM or between Cisco MGMs due to wrong ftp username/password.

Step 1 Check whether ftp username and password are correct.

Step 2 Check whether cwmftpd.log is having exception like this, if ftp username/password are wrong.

(22589:204248) 10:12:27 ERR: %FtpException-3-LOGIN_FAILED: Login failed.

[login,host=172.23.30.111,user=superuser]

Defect Information—If username/password are correct, but still LOGIN_FAILED are shown in logs, collect cwmftpd.log, cwmftpd.request_log and logs of the process for which files are not getting transferred by cwmftpd.

Related key index entries: login failed.

C.15.3.5 cwmftpd—File Not Available On Switch

Files are not transferred since it file is not available.

Step 1 Check whether file is available in the target switch.

Step 2 Check whether cwmftpd.log is having exception like this.

FtpException-3-FTPERR_550: Requested action not taken. File unavailable (e.g., file not found, no access). [550 File "/stat/1-05-Con-062020031215" not found or permission problem]

Defect Information—If file is available, but file is not ftp'd and FTPERR_550 exception is thrown, then collect cwmftpd.log, cwmftpd.request_log and logs of the process for which files are not getting transferred by cwmftpd and report the problem.

Possible alternative workaround—None

Related key index entries: file unavailable, ftperr_550, requested action not taken.

C.15.3.6 FTP Sessions in Switch

Switch allows only four ftp sessions. When cwmftpd makes a request to open a session, if the switch cannot service the request because it has reached its session limit or if the file is locked, then it will respond with a special error message "499 Session limit reached, queuing <IP address> key <Nodename/XXXXXXXX>".

Key is a unique string for the node that is used later when the session is available. Cisco MGM waits on a TCP Port 5120 for the switch to connect to. When a session is available, switch connects to the pre-defined port and sends the [KEY] as data to Cisco MGM. Cisco MGM uses to <KEY> to identify which switch it needs to open the session with. The session should now be opened without encountering a failure and cwmftpd can proceed with the FTP request.

The switch will reserve the session for the Cisco MGM station for 30 seconds before it services other stations. MGMftpd will retrieve multiple files within a single FTP session. A maximum limit per session will be imposed.

This feature is supported in Cisco MGM 12 and above with MGX 8850 Release 4 and above. For SWSW lower than MGX 8850 Release 4, switch will respond with "421 Session limit reached, closing control connection".

The number of ftp sessions currently opened by switch can be determined by executing the switch command, dsptasks. For each ftp session, 'dsptasks' output will have entry like following.

FtpdServ1 0x9a00a1 0x82d8a8a0

If there are two sessions, there will be two entries.

Related key index entries: switch ftp session

C.15.3.7 421 Session Limit Reached

For SWSW lower than MGX8850 Release 4, switch will respond with "421 Session limit reached, closing control connection" , when it reached the limitation of four ftp sessions.

This is limitation on switch for SWSW lower than Release 4.

Step 1 Check whether really all four sessions are opened by opening a manual FTP session to switch or by switch command - dsptasks.

Step 2 Check whether it succeeds.

Defect Information—If manually opening the FTP session succeeds or dsptasks command shows less than four entries for 'FtpdServ', but still cwmftpd throws FTPERR_421, then report the problem with cwmftpd.log, cwmftpd.request_log and logs of the process for which files are not getting transferred by cwmftpd.

Possible alternative workaround—None

Related key index entries: service not available, closing control connection, 421, session limit reached, ftperr_421

C.15.3.8 499 Session Limit Reached

For SWSW MGX8850 Release 4 and later, switch will respond with "499 Session limit reached, queuing <IP address> key <Nodename/XXXXXXXX>", when it reached the limitation of four ftp sessions.

cwmftpd will throw the exception FTPERR_499, when it tries to connect to a switch which responded with error, "499 Session limit reached, queuing <IP address> key <Nodename/XXXXXXXX>".

Step 1 Check whether really all four sessions are opened by opening a manual FTP session to switch or by switch command - dsptasks.

Step 2 Check whether it succeeds.

Defect Information—If manually opening the FTP session succeeds or dsptasks command shows less than four entries for 'FtpdServ' , but still cwmftpd throws FTPERR_499, then report the problem with cwmftpd.log, cwmftpd.request_log and logs of the process for which files are not getting transferred by cwmftpd.

Related key index entries: 499, session limit reached, key, ftperr_499.

C.15.3.9 Acquiring a Session With Switch

For MGX8850 Release 4 and above, Cisco MGM will wait in predefined port to acquire the session, if it receives "499 Session limit reached" error. This wait time is 1 min by default and configurable. If Cisco MGM won't get response from switch within this wait time, it will timeout and throw the following exception and then again retries to open the session.

(9583: 6) 08:37:29 ERR: %CwmFtpDaemonException-3-SESSION_TIMEOUT: Session [Id[28], ClientSeq#[6521], Host[172.25.69.218], User[superuser], Priority[3]:get /stat/1-04-Con-052920030730 /opt/svplus/spool/MGX98101-1-04-Con-052920030730-2] timeout in 3 minutes and needs to be retried.

It will retry 5 times by default (It is configurable). If all retries fails, cwmftpd will throw the following exception.

(9583:172473) 08:37:58 ERR: %CwmFtpDaemon-3-SESSION_FAIL: Thread [Host [172.2

5.69.218] User[superuser] NoRequest] failed to acquire session after 5 retries. Session wait time[5].

Related key index entries: switch, session, ftp

C.15.3.10 Failed to Acquire Session After All Retries

cwmftpd failed to acquire a session with switch with all retries.

Step 1 Check whether really all four sessions are opened by opening a manual FTP session to switch.

Step 2 Check whether it succeeds.

Defect Information—If manually opening the FTP session succeeds, but still cwmftpd throws SESSION_FAIL exception, then report the problem with cwmftpd.log, cwmftpd.request_log and logs of the process for which files are not getting transferred by cwmftpd.

Possible alternative workaround—None

Related key index entries: session_timeout, session_fail

C.15.3.11 General Log Information

cwmftpd.request_log will have one entry for each request. It will have information about the request is succeeded or failed and how much time it took. It has information in a short/simple format and since there is not much data per request, the file has more data in terms of amount of time.

cwmftpd maintains information based on the IP address of the node. To track request for a particular node, grep for the IP address as the keyword in cwmftp.log and cwmftpd.request_log.

When OOEMC sends FTP requests, it also sends the nodeId along with the request as part of the destination file. This nodeId is used to retrieve the ftp user/password from the node_info table. This can be used for user/password validation.

Following keywords are from cwmftpd.log file.

TRANSFER_STARTED - Specifies that cwmftpd started transferring file.

TRANSFER_COMPLETED - Specifies file is transferred completely and also gives information about local and remote file size.

TRANSFER_RATE - Specifies rate of transfer with no. of bytes transferred and the time.

TRANSFER_RETRY - Specifies that transfer request need to be retried.

TRANSFER_FAILED - Specifies that cwmftpd unable to transfer the file.

CONTROL_CONN_TIMEOUT - This exception will be thrown where there is no transfer of information for X seconds once ftp session is opened.

Related key index entries: ftp log

Statistics Summary

This appendix defines the statistics that are collected from the following nodes:

- Cisco MGX 8880 PXM45-based
- Cisco MGX 8850 PXM45-based

D.1 Data Transmission Process Overview details how data travels through two cards that are connected across the bus.

The statistics are categorized under a major grouping known by an object type name and organized by the subobject type number. Within the subtype, each statistic contains a statistic type number.

The following sections provide the reporting parameters for the various statistic types:

- D.1 Data Transmission Process Overview
- D.2 Service Line Statistics
- D.3 Port Statistics
- D.4 Card Statistics
- D.5 Path Statistics
- D.6 PNNI Network Statistics
- D.7 Protocol Statistics
- D.8 Physical Line Statistics

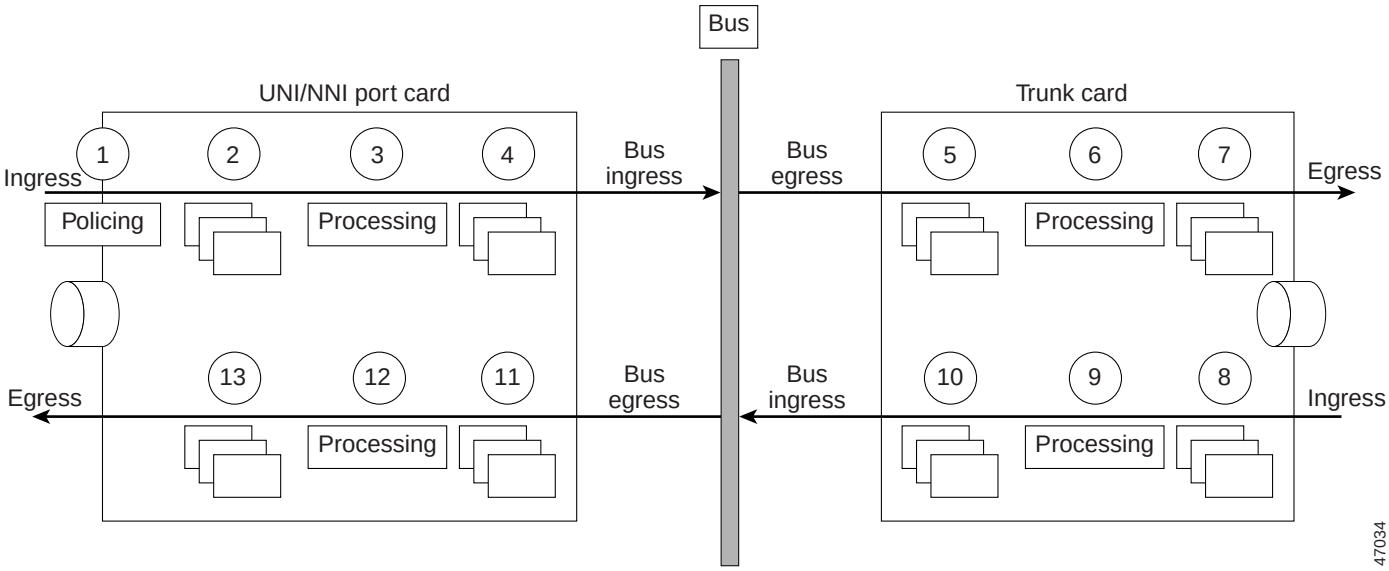
The statistics are organized in ascending order by object type then subobject type.

Note The IDs of the statistics that are collected by Cisco MGM do not correspond to the IDs of the statistics that are collected by the switch.

D.1 Data Transmission Process Overview

Statistics are collected at different points during data transmission. Figure 1 shows how data travels through two cards that are connected across the bus.

Figure 1 Data Flow Through Two Cards Connected Across a Bus



The ingress direction describes traffic that travels toward the bus. The egress direction describes traffic that travels from the bus.

The numbers in Figure 1 correspond to the points at which statistics are collected. Points 1–7 show data on the incoming path with policing. Points 8–13 show data on the return path without policing.

- 1—Data enters the UNI/NNI port card (ingress).
- 2—Data is queued (ingress).
- 3—Data is scheduled for admission onto the bus (ingress).
- 4—Data is queued for going onto the bus (ingress).
- 5—Data is queued for being taken off the bus (egress).
- 6—Data is processed on the trunk card (egress).
- 7—Data is queued for going out the trunk (egress).
- 8—Data enters the card from the trunk (ingress).
- 9—Data is scheduled for admission onto the bus (ingress).
- 10—Data is queued for going onto the bus (ingress).
- 11—Data is queued for being taken off the bus (egress).
- 12—Data is processed on the port card (egress).
- 13—Data is queued for going out the port (egress).

Note The data flow process might vary depending on the card type. See the corresponding sections in this chapter.

D.1 Connection Statistics

The following connection statistics are applicable:

- D.1.1 AXSM Connection
- D.1.2 AXSM-E Connection
- D.1.3 VXSM ATM Connection Statistics

D.1.1 AXSM Connection

This section provides information about the statistics contained in the AXSM_ATM_conn group. This group contains statistics that are applicable AXSM card on the Cisco MGX 8850 PXM45-based switch.

Table D-1 lists the attributes that are common to all of the AXSM connection statistics.

Table D-1 Attributes Common to all AXSM Connection Statistics

Object	Attribute
Front Cards	MGX-AXSM-16-T3E3, MGX-AXSM-16-155, MGX-AXSM-4-622, MGX-AXSM-1-2488
Back Cards	MGX-SMB-8-T3, MGX-SMB-8-E3, MGX-SMB-4-155, MGX-SMFIR-8-155, MGX-SMFLR-8-155, MGX-MMF-8-155, MGX-SMFLR-2-622, MGX-SMFIR-2-622, MGX-SMFSR-1-2488, MGX-SMFLR-1-2488, MGX-SMFXLR-1-2488
Object Type	0
Subobject Type	12
Default Peak Interval	300 seconds

The AXSM connection statistics are used primarily for gathering billing data.

Table D-2 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-2 AXSM Connection Statistics—Descriptions

Stat ID	AXSM Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Ingress CLP0 Cells From Port	No	Ingress–2, 8	Provides a count of the ingress cells with cell loss priority (CLP) equal to 0 that are received. Range: 0 to (2^{40}–1) cells
1	Ingress CLP1 Cells From Port	No	Ingress–2, 8	Provides a count of the ingress cells with CLP equal to 1 that are received. Range: 0 to (2^{40}–1) cells

Table D-2 AXSM Connection Statistics—Descriptions (continued)

Stat ID	AXSM Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
2	Ingress CLP0 cells discarded	Ingress CLP0+1 cells discarded	Ingress–2, 8	Provides a count of the ingress cells with CLP equal to 0 that are discarded due to policing. Range: 0 to (2^{40}–1) cells
3	Ingress CLP0+1 cells discarded	No	Ingress–2, 8	Provides a count of the total ingress cells with CLP (0+1) that are discarded due to policing. Range: 0 to (2^{40}–1) cells
4	Ingress CLP0+1 non-compliant cells	No	Ingress–2, 8	Provides a count of the total cells that are non-compliant as a result of policing. Depending on the configuration, this count includes cells that are tagged non-compliant or are discarded. Range: 0 to (2^{40}–1) cells
5	Ingress EFCI=1 Cells From Port	No	Ingress–3, 9	Provides a count of the ingress explicit forward congestion indication (EFCI) cells. Range: 0 to (2^{40}–1) cells
6	Ingress EOF=1 Cells From Port	No	Ingress–3, 9	Provides a count of the ingress end of frame (EOF) cells. Range: 0 to (2^{40}–1) cells
7	Egress CLP0 Cells to Port	No	Egress–7, 13	Provides a count of the egress cells with CLP equal to 0. Range: 0 to (2^{40}–1) cells
8	Egress CLP1 Cells to Port	No	Egress–7, 13	Provides a count of the egress cells with CLP equal to 1. Range: 0 to (2^{40}–1) cells
9	Egress EFCI=1 Cells to Port	No	Egress–6, 12	Provides a count of the egress cells with EFCI equal to 1. Range: 0 to (2^{40}–1) cells
10	Egress EOF=1 Cells to Port	No	Egress–6, 12	Provides a count of the egress cells with EOF equal to 1. Range: 0 to (2^{40}–1) cells

D.1.2 AXSM-E Connection

This section provides information about the statistics contained in the AXSME_ATM_conn group. The AXSM-E connection statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-3 lists the attributes that are common to the AXSM-E connection statistics.

Table D-3 AXSM-E Connection Statistics—Common Attributes

Object	Attribute
Front Cards	AXSM-2-622-E, AXSM-8-155-E, AXSM-16-T3E3-E
Back Cards	SMFLR-1-622, SMFIR-1-622, SMFLR-4-155, SMFIR-4-155, MMF-4-155, SMB-4-155, SMB-8-T3, SMB-8-E3
Object Type	0
Subobject Type	13
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E connection statistics are used primarily for gathering troubleshooting and performance data.

Table D-4 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-4 AXSM-E Connection Statistics—Descriptions

Stat ID	AXSM-E Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
1	CLP1 non-compliant cells	Tagged non compliant cells	Ingress–1	Provides a count of the discarded cells with cell loss priority (CLP) bit equal to 1 that are tagged non-compliant. Range: 0 to (2^{40}–1) cells
2	CLP0 non-compliant cells	Tagged non compliant cells	Ingress–1	Provides a count of the discarded cells with CLP equal to 0 that are tagged non-compliant. Range: 0 to (2^{40}–1) cells
3	Tagged non compliant cells	No	Ingress–1	Provides a count of the total number of cells that are tagged non-compliant. These cells are received at the port. Range: 0 to (2^{40}–1) cells

Table D-4 AXSM-E Connection Statistics—Descriptions (continued)

Stat ID	AXSM-E Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
5	CLP0 cells from port	No	Ingress–1	Provides a count of the cells with CLP equal to 0. These cells are received from the port before policing. Range: 0 to (2^{40}–1) cells
6	CLP1 cells from port	No	Ingress–1	Provides a count of the cells with CLP equal to 1. These cells are received from the port before policing. Range: 0 to (2^{40}–1) cells
8	EFCI=1 cells from the port	No	Ingress–2	Provides a count of the cells with the explicit forward congestion indication (EFCI) equal to 1. These cells are received from the port. Range: 0 to (2^{40}–1) cells
12	EFCI=1 cells to the network	No	Ingress–2	Provides a count of the cells with EFCI equal to 1 that are transmitted to the bus after policing. Range: 0 to (2^{40}–1) cells
14	Ingress CLP0 cells discarded in qe	No	Ingress–2	Provides a count of the cells with CLP equal to 0 that are discarded due to an overflow in the queuing engine. Range: 0 to (2^{40}–1) cells
15	Ingress CLP1 cells discarded in qe	No	Ingress–2	Provides a count of the cells with CLP equal to 1 that are discarded due to an overflow in the queuing engine. Range: 0 to (2^{40}–1) cells
19	CLP1 cells to the port	No	After 13	Provides a count of the cells with CLP equal to 1 that are transmitted to the port. Range: 0 to (2^{40}–1) cells
20	CLP0 cells to the port	No	After 13	Provides a count of the cells with CLP equal to 0 that are transmitted to the port. Range: 0 to (2^{40}–1) cells
23	EFCI=1 cells to the port	No	Egress–13	Provides a count of the cells with EFCI equal to 1 that are transmitted to the port. Range: 0 to (2^{40}–1) cells
28	EFC1=1 cells from the network	No	Egress–13	Provides a count of the cells with EFCI equal to 1 that are received from the bus prior to queuing. Range: 0 to (2^{40}–1) cells

Table D-4 AXSM-E Connection Statistics—Descriptions (continued)

Stat ID	AXSM-E Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
30	Egress CLP0 cells discarded in qe	No	Egress–13	Provides a count of the cells with CLP equal to 0 that are discarded due to an overflow in the queuing engine. Range: 0 to (2^{40}–1) cells
31	Egress CLP1 cells discarded in qe	No	Egress–13	Provides a count of the cells with CLP equal to 1 that are discarded due to an overflow in the queuing engine. Range: 0 to (2^{40}–1) cells

D.1.3 VXSM ATM Connection Statistics

This section provides information about the statistics contained in the VXSM_ATM_conn group. The VXSM connection statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-5 lists the attributes that are common to all of the VXSM connection statistics.

Table D-5 Attributes Common to all VXSM Connection Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	0
Subobject Type	17
Default Peak Interval	300 seconds

Table D-6 includes the VXSM ATM connection statistics.

Table D-6 VXSM ATM Connection Statistics—Descriptions

Stat ID	VXSM ATM Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Total Ingress Cells from port	—	Ingress	Provides a count of the total ingress cells. Range: 0 to (2^{64}–1)
1	CLP0 cells from port (before policing)	—	Ingress–1	Provides a count of the ingress cells with cell loss priority (CLP) equal to 0 that are received prior to policing. Range: 0 to (2^{64}–1)
2	CLP1 cells from port (before policing)	—	Ingress–1	Provides a count of the ingress cells with cell loss priority (CLP) equal to 1 that are received prior to policing. Range: 0 to (2^{64}–1)

Table D-6 VXSM ATM Connection Statistics—Descriptions (continued)

Stat ID	VXSM ATM Connection Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
3	EFCI=1 CLP0 cells from the port	—	Ingress	Provides a count of the CLP0 cells with the explicit forward congestion indication (EFCI) equal to 1. These cells are received from the port. Range: 0 to (2^{64}–1)
4	EFCI=1 CLP1 cells from the port	—	Ingress	Provides a count of the CLP1 cells with the explicit forward congestion indication (EFCI) equal to 1. These cells are received from the port. Range: 0 to (2^{64}–1)
5	Total Egress Cells to network	—	Egress	Provides a count of the total egress cells. Range: 0 to (2^{64}–1)
6	CLP0 cells to network (before policing)	—	Egress–1	Provides a count of the egress cells with cell loss priority (CLP) equal to 0 that are received prior to policing. Range: 0 to (2^{64}–1)
7	CLP1 cells to network (before policing)	—	Egress–1	Provides a count of the egress cells with cell loss priority (CLP) equal to 1 that are received prior to policing. Range: 0 to (2^{64}–1)
8	EFCI=1 CLP0 cells to the network	—	Egress	Provides a count of the CLP0 cells with the explicit forward congestion indication (EFCI) equal to 1. Range: 0 to (2^{64}–1)
9	EFCI=1 CLP1 cells to the network	—	Egress	Provides a count of the CLP1 cells with the explicit forward congestion indication (EFCI) equal to 1. Range: 0 to (2^{64}–1)

D.2 Service Line Statistics

The following service line statistics are applicable:

- D.2.1 CESM, FRSM, SRM, and SRME T3/E3 Service
- D.2.2 SRM and SRME SONET Service Line
- D.2.3 AXSM Line
- D.2.4 AXSM-E Line

D.2.1 CESM, FRSM, SRM, and SRME T3/E3 Service

This section provides information about the statistics contained in the MGX-T3/E3 group. The CESM, FRSM, SRM, and SRME T3/E3 service line statistics are applicable to the Cisco MGX 8230, Cisco MGX 8250, Cisco MGX 8850 PXM1-based nodes.

Table D-7 lists the attributes that are common to all of the CESM, FRSM, SRM, and SRME T3/E3 service line statistics.

Table D-7 Attributes Common to all CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics

Object	Attribute
Front Cards	AX-CESM-8T1, AX-CESM-8E1, MGX-CESM-T3, MGX-CESM-E3, FRSM-8T1, FRSM-8E1, FRSM-2CT3, FRSM-2T3, FRSM-2E3, FRSM-HS2, FRSM-HS1, SRM-3T3, SRME-3T3
Back Cards	RJ48-8T1, RJ48-8E1, SMB-8E1, BNC-2T3, BNC-2E3, SCSC2-2HSSI
Object Type	1
Subobject Type	6
Default Peak Interval	60 seconds (fixed setting)

The CESM, FRSM, SRM, and SRME T3/E3 service line statistics are used primarily for gathering billing and performance

Table D-8 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-8 CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics—Descriptions

Stat ID	CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
2	Out of Frames	No	Ingress–1	Provides a count of the times an out of frame (OOF) is detected. The count includes the number of OOF alarms. Range: 0 to (2^{32}–1)
3	Losses of Signal	No	Ingress–1	Provides a count of the times a loss of signal (LOS) is detected. The count includes the number of LOS alarms. Range: 0 to (2^{32}–1)
28	B3ZS Line Code Violations	No	Ingress–1	Provides a count of the B3ZS line code violations that are encountered by the interface. These violations occur when more than three zeroes in a row are transmitted. Range: 0 to (2^{32}–1)

Table D-8 CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics—Descriptions (continued)

Stat ID	CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
29	Line Errored Seconds	No	Ingress–1	Provides a count of the line code violation errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
30	Line Severely Errored Seconds	Line Errored Seconds	Ingress–1	Provides a count of the line code violation severely errored seconds (SES) that occur within the collection interval. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
31	P-bit Line Parity Errors	No	Ingress–1	Provides a count of the parity bit (P-bit) code violations that are encountered by the interface. Range: 0 to (2^{32}–1)
32	Errored Seconds–Parity	No	Ingress–1	Provides a count of the parity code violation (PCV) errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
33	Severely Errored Seconds–Parity	Errored Seconds–Parity	Ingress–1	Provides a count of the P-bit code SES violations that occur within the collection interval. Range: 0 to (2^{32}–1)
34	C-bit Parity Code Violations	No	Ingress–1	Provides a count of the C Bit code violations that are encountered by the interface. Range: 0 to (2^{32}–1)
35	Errored Seconds–Path	No	Ingress–1	Provides a count of the PCV errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
36	Severely Errored Seconds–Path	Errored Seconds–Path	Ingress–1	Provides a count of the PCV severely errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
37	Severely Errored Framing Seconds	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
38	Alarm Indication Signal Seconds	No	Ingress–1	Provides a count of the alarm seconds that occur within the collection interval. Range: 0 to (2^{32}–1)

Table D-8 CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics—Descriptions (continued)

Stat ID	CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
39	Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
144	FEBE Counts	No	Ingress–1	Provides a count of the far end block errors (FEBEs) that are detected. Range: 0 to (2^{32}–1)
145	FE Counts	No	Ingress–1	Provides a count of the framing pattern errors that are encountered by a DS3/E3 interface. Range: 0 to (2^{32}–1)
150	YEL Transitions	No	Ingress–1	Provides a count of the times yellow alarms are detected. The count includes the number of remote alarm indicator (RAI) alarms. Range: 0 to (2^{32}–1)
220	Excessive Zero Counts	No	Ingress–1	Provides a count of the excessive zero bits that are encountered by the interface. Excessive zeros are three or more zeros occurring on the line. Range: 0 to (2^{32}–1)
221	PLCP OOF Transition Counts	No	Ingress–1	Provides a count of the times the OOF is detected by the physical layer convergence protocol (PLCP) interface. Range: 0 to (2^{32}–1)
222	PLCP Remote Alarm Indication	No	Ingress–1	Provides a count of the remote alarms that are detected by the PLCP interface. Range: 0 to (2^{32}–1)
223	PLCP Framing Errors	No	Ingress–1	Provides a count of the framing errors that are detected by the PLCP interface. Range: 0 to (2^{32}–1)
224	PLCP FEBE Counts	No	Ingress–1	Provides a count of the FEBEs that are encountered by the PLCP interface. Range: 0 to (2^{32}–1)
225	PLCP FEBE Err Secs	No	Ingress–1	Provides a count of the FEBE seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
226	PLCP FEBE Severely Err Secs	PLCP FEBE Err Secs	Ingress–1	Provides a count of the FEBE severely errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)

Table D-8 CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics—Descriptions (continued)

Stat ID	CESM, FRSM, SRM, and SRME T3/E3 Service Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
227	PLCP HCS Errors	No	Ingress–1	Provides a count of the cell header checksum errors that are encountered by the PLCP interface. Range: 0 to (2^{32}–1)
228	PLCP HCS Errored Secs	No	Ingress–1	Provides a count of the cell header checksum errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
229	PLCP HCS Severely Errored Secs	PLCP HCS Err Secs	Ingress–1	Provides a count of the cell header checksum severely errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
230	PLCP BIP-8 Code Violations	No	Ingress–1	Provides a count of the BIP-8 code violations that are encountered by the interface. Range: 0 to (2^{32}–1)
231	PLCP BIP8 CV Err Secs	No	Ingress–1	Provides a count of the BIP-8 code violation errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
232	PLCP BIP8 CV Severely Err Secs	PLCP BIP8 CV Err Secs	Ingress–1	Provides a count of the BIP-8 code violation severely errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
233	PLCP Severely Err Framing Secs	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
234	PLCP Unavailable Secs	No	Ingress–1	Provides a count of the unavailable seconds that occur within the collection interval. Range: 0 to (2^{32}–1)
235	Alarm Indication Signal Severely Seconds	No	Ingress–1	Provides a count of the alarm indication signal (AIS) severely errored seconds that occur within the collection interval. Range: 0 to (2^{32}–1)

D.2.2 SRM and SRME SONET Service Line

This section provides information about the statistics contained in the SONET group. The SONET line statistics are applicable to the SRM and SRME cards on the Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 PXM1-based nodes.

Table D-9 lists the attributes that are common to all of the SONET line statistics.

Table D-9 Attributes Common to all SONET Line Statistics

Object	Attribute
Front Card	SRM, SRME
Back Card	SRM-3T3-NOBC
Object Type	1
Subobject Type	10
Default Peak Interval	60 seconds (fixed setting)

The SRM and SRME SONET line statistics are used primarily for gathering billing and performance data.

Table D-10 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-10 SRM and SRME SONET Line Statistics—Descriptions

Stat ID	SRM and SRME SONET Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
236	Sonet Loss of Signal	—	—	Provides a count of the times a loss of signal (LOS) is detected. The count includes the number of LOS alarms. Range: 0 to (2^{32}–1)
237	Sonet Loss of Frames	—	—	Provides a count of the loss of frames (LOFs) that are encountered by a SONET line. Range: 0 to (2^{32}–1)
238	Sonet Path alarm Indictn sgnl secs	—	—	Provides a count of the alarm indication signal (AIS) instances on the path. Range: 0 to (2^{32}–1)
239	Sonet Remote Failure Indication	—	—	Provides a count of the remote failure indications (RFIs) that occur. Range: 0 to (2^{32}–1)

Table D-10 SRM and SRME SONET Line Statistics—Descriptions (continued)

Stat ID	SRM and SRME SONET Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
240	Sonet Line Alarm indication signal	—	—	Provides a count of the times that an alarm indication signal is detected on the line. Range: 0 to (2^{32}–1)
241	Sonet Line Remote Far end Indicatn	—	—	Provides a count of the remote failure indications (RFIs) that are encountered by a SONET line. Range: 0 to (2^{32}–1)

D.2.3 AXSM Line

This section provides information about the ATM line statistics contained in the AXSM_ATM_line group. The AXSM ATM line statistics are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-11 lists the attributes that are common to all of the AXSM line statistics.

Table D-11 Attributes Common to all AXSM Line Statistics

Object	Attribute
Front Card	MGX-AXSM-16-T3E3, MGX-AXSM-16-155, MGX-AXSM-4-622, MGX-AXSM-1-2488
Back Cards	MGX-SMB-8-T3, MGX-SMB-8-E3, MGX-SMB-4-155, MGX-SMFIR-8-155, MGX-SMFLR-8-155, MGX-MMF-8-155, MGX-SMFLR-2-622, MGX-SMFIR-2-622, MGX-SMFSR-1-2488, MGX-SMFLR-1-2488, MGX-SMFXLR-1-2488
Object Type	1
Subobject Type	11
Default Peak Interval	300 seconds

The AXSM line statistics are used primarily for gathering billing data.

Table D-12 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-12 AXSM Line Statistics—Descriptions

Stat ID	AXSM Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Ingress CLP0 Cells From Port	Ingress CLP0+1 Cells	Ingress–2, 8	Provides a count of the ingress cells with cell loss priority (CLP) equal to 0 that are received. Range: 0 to (2^{40}–1) cells
1	Ingress CLP1 Cells From Port	Ingress CLP0+1 Cells	Ingress–2, 8	Provides a count of the ingress cells with CLP equal to 1 that are received. Range: 0 to (2^{40}–1) cells
2	Ingress CLP0+1 Cells From Port	No	Ingress–2, 8	Provides a count of the ingress cells with CLP (0+1) that are received. Range: 0 to (2^{40}–1) cells
3	Ingress UPC CLP0 Discards	Ingress UPC CLP0+1 Discards	Ingress–2, 8	Provides a count of the total cells with CLP equal to 0 that are discarded due to usage parameter control (UPC). Range: 0 to (2^{40}–1) cells
4	Ingress UPC CLP0+1 Discards	No	Ingress–2, 8	Provides a count of the total cells with CLP (0+1) that are discarded due to UPC. Range: 0 to (2^{40}–1) cells
5	Ingress Non-Compliant CLP0+1	No	Ingress–2, 8	Provides a count of the total cells with CLP (0+1) that are non-compliant or discarded due to policing. Range: 0 to (2^{40}–1) cells
6	Ingress Total Valid OAM Cells	No	Ingress–2, 8	Provides a count of the ingress operation, administration, and maintenance (OAM) cells that have a valid cell type and function type. Range: 0 to (2^{40}–1) cells
7	Ingress Total Valid RM Cells	No	Ingress–2, 8	Provides a count of the ingress resource management (RM) cells that have a valid cell type and function type. Range: 0 to (2^{40}–1) cells
8	Ingress Total Errored OAM/RM cells	No	Ingress–2, 8	Provides a count of the total errored OAM and RM cells in the ingress direction. The errored cells include: • OAM cells with an incorrect CRC-10 • Undefined OAM or function type • RM cells with an incorrect CRC-10 Range: 0 to (2^{40}–1) cells

Table D-12 AXSM Line Statistics—Descriptions (continued)

Stat ID	AXSM Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
9	Ingress non-zero GFC cells	No	Ingress–2, 8	Provides a count of the cells with a non-zero generic flow control (GFC) field. This statistic is applicable only for UNI and ingress directions. Range: 0 to (2^{40}–1) cells
10	Ingress Invalid VPI/VCI Cells	No	Ingress–2, 8	Provides a count of the ingress cells with an unassigned or invalid virtual path identifier (VPI) or virtual channel identifier (VCI). Range: 0 to (2^{40}–1) cells
11	Ingress Last Unknown VPI.VCI (invalid)	No	Ingress–2, 8	Provides the last unknown VPI.VCI value on the line. Range: VPI/VCI value
12	Ingress HEC Errored Cells Discarded	Ingress Total HEC-errored Cells	Ingress–2, 8	Provides a count of the header error control (HEC) errored cells that are discarded on the line. Range: 0 to (2^{40}–1) cells
13	Ingress HEC Errored Cells Corrected	Ingress Total HEC-errored Cells	Ingress–2, 8	Provides a count of the HEC errored cells that are corrected on the line. Range: 0 to (2^{40}–1) cells
14	Ingress Total HEC-errored cells	No	Ingress–2, 8	Provides a count of the total HEC errored cells that are received on the line. Range: 0 to (2^{40}–1) cells
15	Egress CLP0 Cells to Port	Egress CLP0+1 Cells	Egress–7, 13	Provides a count of the egress cells with CLP equal to 0. Range: 0 to (2^{40}–1) cells
16	Egress CLP1 Cells to Port	Egress CLP0+1 Cells	Egress–7, 13	Provides a count of the egress cells with CLP equal to 1. Range: 0 to (2^{40}–1) cells
17	Egress CLP0+1 Cells to Port	No	Egress–7, 13	Provides a count of the egress cells with CLP (0+1). Range: 0 to (2^{40}–1) cells
18	Egress OAM Valid cells	No	Egress–7, 13	Provides a count of the egress valid OAM cells. Range: 0 to (2^{40}–1) cells
19	Egress RM Valid Cells	No	Egress–7, 13	Provides a count of the egress RM valid cells. Range: 0 to (2^{40}–1) cells

Table D-12 AXSM Line Statistics—Descriptions (continued)

Stat ID	AXSM Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
20	Egress OAM/RM Errored Cells	No	Egress–7, 13	Provides a count of the errored OAM and RM cells in the egress direction. The errored cells include: • OAM cells with an incorrect CRC-10 • Undefined OAM type or function type • RM cells with an incorrect CRC-10 Range: 0 to (2^{40}–1) cells
21	Egress Invalid VPI/VCI Cells	No	Egress–7, 13	Provides a count of the egress cells with errored headers. This count includes cells with an unassigned or invalid VPI or VCI. Range: 0 to (2^{40}–1) cells

D.2.4 AXSM-E Line

This section provides information about the ATM statistics contained in the AXSME_ATM_line group. The AXSM-E line statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-13 lists the attributes that are common to the AXSM-E line statistics.

Table D-13 Attributes Common to all AXSM-E Line Statistics

Object	Attribute
Front Cards	AXSM-2-622-E, AXSM-8-155-E, AXSM-16-T3E3-E
Back Cards	SMFLR-1-622, SMFIR-1-622, SMFLR-4-155, SMFIR-4-155, MMF-4-155, SMB-4-155, SMB-8-T3, SMB-8-E3
Object Type	1
Subobject Type	12
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E line statistics are used primarily for gathering troubleshooting and performance data.

Table D-14 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-14 AXSM-E Line Statistics—Descriptions

Stat ID	AXSM-E Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Ingress CLP0 cells received	Cells received	Ingress–1	Provides a count of the ingress cells with cell loss priority (CLP) equal to 0 that are received. Range: 0 to (2^{40}–1) cells
1	Ingress CLP1 cells received	Cells received	Ingress–1	Provides a count of the ingress cells with CLP equal to 1 that are received. Range: 0 to (2^{40}–1) cells
2	Ingress valid OAM cells received	No	Ingress–1	Provides a count of the operation, administration, and maintenance (OAM) that are received at the port. Range: 0 to (2^{40}–1) cells
3	Ingress valid RM cells received	No	Ingress–1	Provides a count of the resource management (RM) cells that are received at the port. Range: 0 to (2^{40}–1) cells
4	UNI only cells received	No	Ingress–1	Provides a count of the cells tagged as UNI. These cells are received at the port. Range: 0 to (2^{40}–1) cells
5	Error OAM cells received	No	Ingress–1	Provides a count of the errored OAM cells that are received. The errored cells include: • OAM cells with an incorrect CRC-10 • Undefined OAM type or function type Range: 0 to (2^{40}–1) cells
6	Ingress cells received with header error	No	Before–1	Provides a count of the total cells with a header error. These cells are received at the port. Range: 0 to (2^{40}–1) cells
7	Egress CLP0 cells received	Cells transmitted	After 13	Provides a count of the cells with CLP equal to 0 that are received at the port in the egress direction. Range: 0 to (2^{40}–1) cells
8	Egress CLP1 cells received	Cells transmitted	After 13	Provides a count of the cells with CLP equal to 1 that are received at the port in the egress direction. Range: 0 to (2^{40}–1) cells
9	Egress valid OAM cells received	Cells transmitted	After 13	Provides a count of the OAM cells that are received at the port in the egress direction. Range: 0 to (2^{40}–1) cells

Table D-14 AXSM-E Line Statistics—Descriptions (continued)

Stat ID	AXSM-E Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
10	Egress valid RM cells received	Cells transmitted	After 13	Provides a count of the RM cells that are received at the port in the egress direction. Range: 0 to (2^{40}–1) cells
11	Egress OAM cells received with errors	No	After 13	Provides a count of the errored OAM cells that are received at the port in the egress direction. The errored cells include: • OAM cells with an incorrect CRC-10 • Undefined OAM type or function type Range: 0 to (2^{40}–1) cells
12	Uncorrectable header errors	No	Before 1	Provides a count of the cells that are discarded due to uncorrectable header errors. Range: 0 to (2^{40}–1) cells
13	Corrected header errors	No	Before 1	Provides a count of the cells with header errors that are corrected. Range: 0 to (2^{40}–1) cells
14	Idle/unassigned cells	No	Before 1	Provides a count of the idles or unassigned cells that are received. Range: 0 to (2^{40}–1) cells
15	Cells received	No	Ingress–1	Provides a count of the total cells that are received at the port. Range: 0 to (2^{40}–1) cells
16	Cells transmitted	No	After 13	Provides a count of the total cells that are transmitted. Range: 0 to (2^{40}–1) cells

D.3 Port Statistics

The following port statistics are supported:

- D.3.1 AXSM Port
- D.3.2 AXSM-E Port
- D.3.3 VXSM Port Statistics

D.3.1 AXSM Port

This section provides information about the statistics contained in the AXSM_ATM_ port group. The statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-15 lists the attributes that are common to all of the AXSM port statistics.

Table D-15 Attributes Common to all AXSM Port Statistics

Object	Attribute
Front Cards	MGX-AXSM-16-T3E3, MGX-AXSM-16-155, MGX-AXSM-4-622, MGX-AXSM-1-2488
Back Cards	MGX-SMB-8-T3, MGX-SMB-8-E3, MGX-SMB-4-155, MGX-SMFIR-8-155, MGX-SMFLR-8-155, MGX-MMF-8-155, MGX-SMFLR-2-622, MGX-SMFIR-2-622, MGX-SMFSR-1-2488, MGX-SMFLR-1-2488, MGX-SMFXLR-1-2488
Object Type	3
Subobject Type	9
Default Peak Interval	300 seconds

The AXSM port statistics are used primarily for gathering performance data.

Table D-16 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-16 AXSM Port Statistics—Descriptions

Stat ID	AXSM Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Ingress CLP0 Cells From Policer	No	Ingress–3, 9	Provides a count of the cells with cell loss priority (CLP) equal to 0 that arrive at the queueing engine. The count includes both discarded and non-discarded cells. Range: 0 to (2^{40}–1) cells
1	Ingress CLP1 Cells From Policer	No	Ingress–3, 9	Provides a count of the cells with CLP equal to 1 that arrive at the queueing engine. The count includes both discarded and non-discarded cells. Range: 0 to (2^{40}–1) cells
2	Ingress CLP0 Cells Discarded (dropped)	Ingress CLP0 Cells From Policer	Ingress–3, 9	Provides a count of ingress cells with CLP equal to 0 that are discarded by the queueing engine. Range: 0 to (2^{40}–1) cells
3	Ingress CLP1 Cells Discarded (dropped)	Ingress CLP0 Cells From Policer	Ingress–3, 9	Provides a count of ingress cells with CLP equal to 1 that are discarded by the queueing engine. Range: 0 to (2^{40}–1) cells
4	Ingress CLP0 Cells to backplane	No	Ingress–3, 9	Provides a count of the cells with CLP equal to 0 that travel from the queueing engine to the bus. Range: 0 to (2^{40}–1) cells

Table D-16 AXSM Port Statistics—Descriptions (continued)

Stat ID	AXSM Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
5	Ingress CLP1 Cells to backplane	No	Ingress–3, 9	Provides a count of the cells with CLP equal to 1 that travel from the queueing engine to the bus. Range: 0 to (2^{40}–1) cells
6	Egress CLP0 Cells From backplane	No	Egress–6, 12	Provides a count of the cells with CLP equal to 0 that arrive at the queueing engine. The count includes both discarded and non-discarded cells. Range: 0 to (2^{40}–1) cells
7	Egress CLP1 Cells From backplane	No	Egress–6, 12	Provides a count of the cells with CLP equal to 1 that arrive at the queueing engine. The count includes both discarded and non-discarded cells. Range: 0 to (2^{40}–1) cells
8	Egress CLP0 Cells Discarded (dropped)	Egress CLP0 Cells From backplane	Egress–6, 12	Provides a count of egress cells with CLP equal to 0 that are discarded by the queueing engine. Range: 0 to (2^{40}–1) cells
9	Egress CLP1 Cells Discarded (dropped)	Egress CLP1 Cells From backplane	Egress–6, 12	Provides a count of egress cells with CLP equal to 1 that are discarded by the queueing engine. Range: 0 to (2^{40}–1) cells
10	Egress CLP0 Cells to port	No	Egress–6, 12	Provides a count of the cells with CLP equal to 0 that travel from the queueing engine to the line. Range: 0 to (2^{40}–1) cells
11	Egress CLP1 Cells to port	No	Egress–6, 12	Provides a count of the cells with CLP equal to 1 that travel from the queueing engine to the line. Range: 0 to (2^{40}–1) cells
12	Egress Total OAM Cells	No	Egress–6, 12	Provides a count of the operation, administration, and maintenance (OAM) cells that travel from the queueing engine to the line. Range: 0 to (2^{40}–1) cells

D.3.2 AXSM-E Port

This section provides information about the statistics contained in the AXSME_ATM_port group. The AXSM-E port statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-17 lists the attributes that are common to the AXSM-E port statistics.

Table D-17 Attributes Common to all AXSM-E PortStatistics

Object	Attribute
Front Cards	AXSM-2-622-E, AXSM-8-155-E, AXSM-16-T3E3-E
Back Cards	SMFLR-1-622, SMFIR-1-622, SMFLR-4-155, SMFIR-4-155, MMF-4-155, SMB-4-155, SMB-8-T3, SMB-8-E3
Object Type	3
Subobject Type	11
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E port statistics are used primarily for gathering troubleshooting and performance data.

Table D-18 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-18 AXSM-E Port Statistics—Descriptions

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	CLP0 cells transmitted	No	After 13	Provides a count of the cells with CLP equal to 0 that are transmitted to the port. Range: 0 to (2^{40}–1) cells
1	CLP1 cells transmitted	No	After 13	Provides a count of the total cells with CLP equal to 1 that are transmitted to the port. Range: 0 to (2^{40}–1) cells
2	OAM cells transmitted	No	After 13	Provides a count of the operation, administration, and maintenance (OAM) cells that are transmitted to the port. Range: 0 to (2^{40}–1) cells
3	RM cells transmitted	No	After 13	Provides a count of the resource management (RM) cells that are transmitted to the port. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
4	CLP0 cells not discarded	No	Egress	Provides a count of the cells with CLP equal to 0 that are received at the port. Range: 0 to (2^{40}–1) cells
5	CLP1 cells not discarded	No	Egress	Provides a count of the cells with CLP equal to 1 that are received at the port. Range: 0 to (2^{40}–1) cells
6	CLP0 cells discarded due to congestion	No	Egress	Provides a count of the cells with CLP equal to 0 that are received at the port then discarded due to congestion. Range: 0 to (2^{40}–1) cells
7	CLP1 cells discarded due to congestion	No	Egress	Provides a count of the cells with CLP equal to 1 that are received at the port then discarded due to congestion. Range: 0 to (2^{40}–1) cells
8	OAM cells received	No	Egress	Provides a count of the OAM cells that are received at the port. Range: 0 to (2^{40}–1) cells
9	RM cells received	No	Egress	Provides a count of the RM cells that are received at the port. Range: 0 to (2^{40}–1) cells
10	EFCI cells transmitted	No	Egress–13	Provides a count of the cells with the explicit forward congestion indication (EFCI) bit set that are transmitted to the port. Range: 0 to (2^{40}–1) cells
11	EFCI cells received	No	Egress	Provides a count of the cells with the EFCI bit set that are received at the port. Range: 0 to (2^{40}–1) cells
12	Cells received by Qbin 0	—	—	Provides a count of the cells that are received on Qbin 0. Range: 0 to (2^{40}–1) cells
13	Cells discarded by Qbin 0	—	—	Provides a count of the cells that are discarded on Qbin 0. Range: 0 to (2^{40}–1) cells
14	Cells transmitted by Qbin 0	—	—	Provides a count of the cells that are transmitted out of Qbin 0. Range: 0 to (2^{40}–1) cells
15	Cells received by Qbin 1	—	—	Provides a count of the cells that are received on Qbin 1. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
16	Cells discarded by Qbin 1	—	—	Provides a count of the cells that are discarded on Qbin 1. Range: 0 to (2^{40}–1) cells
17	Cells transmitted by Qbin 1	—	—	Provides a count of the cells that are transmitted by Qbin 1. Range: 0 to (2^{40}–1) cells
18	Cells received by Qbin 2	—	—	Provides a count of the cells that are received on Qbin 2. Range: 0 to (2^{40}–1) cells
19	Cells discarded by Qbin 2	—	—	Provides a count of the cells that are discarded on Qbin 2. Range: 0 to (2^{40}–1) cells
20	Cells transmitted by Qbin 2	—	—	Provides a count of the cells that are transmitted by Qbin 2. Range: 0 to (2^{40}–1) cells
21	Cells received by Qbin 3	—	—	Provides a count of the cells that are received on Qbin 3. Range: 0 to (2^{40}–1) cells
22	Cells discarded by Qbin 3	—	—	Provides a count of the cells that are discarded on Qbin 3. Range: 0 to (2^{40}–1) cells
23	Cells transmitted by Qbin 3	—	—	Provides a count of the cells that are transmitted by Qbin 3. Range: 0 to (2^{40}–1) cells
24	Cells received by Qbin 4	—	—	Provides a count of the cells that are received on Qbin 4. Range: 0 to (2^{40}–1) cells
25	Cells discarded by Qbin 4	—	—	Provides a count of the cells that are discarded on Qbin 4. Range: 0 to (2^{40}–1) cells
26	Cells transmitted by Qbin 4	—	—	Provides a count of the cells that are transmitted by Qbin 4. Range: 0 to (2^{40}–1) cells
27	Cells received by Qbin 5	—	—	Provides a count of the cells that are received on Qbin 5. Range: 0 to (2^{40}–1) cells
28	Cells discarded by Qbin 5	—	—	Provides a count of the cells that are discarded on Qbin 5. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
29	Cells transmitted by Qbin 5	—	—	Provides a count of the cells that are transmitted by Qbin 5. Range: 0 to (2^{40}–1) cells
30	Cells received by Qbin 6	—	—	Provides a count of the cells that are received on Qbin 6. Range: 0 to (2^{40}–1) cells
31	Cells discarded by Qbin 6	—	—	Provides a count of the cells that are discarded on Qbin 6. Range: 0 to (2^{40}–1) cells
32	Cells transmitted by Qbin 6	—	—	Provides a count of the cells that are transmitted by Qbin 6. Range: 0 to (2^{40}–1) cells
33	Cells received by Qbin 7	—	—	Provides a count of the cells that are received on Qbin 7. Range: 0 to (2^{40}–1) cells
34	Cells discarded by Qbin 7	—	—	Provides a count of the cells that are discarded on Qbin 7. Range: 0 to (2^{40}–1) cells
35	Cells transmitted by Qbin 7	—	—	Provides a count of the cells that are transmitted by Qbin 7. Range: 0 to (2^{40}–1) cells
36	Cells received by Qbin 8	—	—	Provides a count of the cells that are received on Qbin 8. Range: 0 to (2^{40}–1) cells
37	Cells discarded by Qbin 8	—	—	Provides a count of the cells that are discarded on Qbin 8. Range: 0 to (2^{40}–1) cells
38	Cells transmitted by Qbin 8	—	—	Provides a count of the cells that are transmitted by Qbin 8. Range: 0 to (2^{40}–1) cells
39	Cells received by Qbin 9	—	—	Provides a count of the cells that are received on Qbin 9. Range: 0 to (2^{40}–1) cells
40	Cells discarded by Qbin 9	—	—	Provides a count of the cells that are discarded on Qbin 9. Range: 0 to (2^{40}–1) cells
41	Cells transmitted by Qbin 9	—	—	Provides a count of the cells that are transmitted by Qbin 9. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
42	Cells received by Qbin10	—	—	Provides a count of the cells that are received on Qbin 10. Range: 0 to (2^{40}–1) cells
43	Cells discarded by Qbin10	—	—	Provides a count of the cells that are discarded on Qbin 10. Range: 0 to (2^{40}–1) cells
44	Cells transmitted by Qbin10	—	—	Provides a count of the cells that are transmitted by Qbin 10. Range: 0 to (2^{40}–1) cells
45	Cells received by Qbin11	—	—	Provides a count of the cells that are received on Qbin 11. If Qbin 11 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
46	Cells discarded by Qbin11	—	—	Provides a count of the cells that are discarded on Qbin 11. If Qbin 11 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
47	Cells transmitted by Qbin11	—	—	Provides a count of the cells that are transmitted by Qbin 11. If Qbin 11 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
48	Cells received by Qbin12	—	—	Provides a count of the cells that are received on Qbin 12. If Qbin 12 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
49	Cells discarded by Qbin12	—	—	Provides a count of the cells that are discarded on Qbin 12. If Qbin 12 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
50	Cells transmitted by Qbin12	—	—	Provides a count of the cells that are transmitted by Qbin 12. If Qbin 12 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
51	Cells received by Qbin13	—	—	Provides a count of the cells that are received on Qbin 13. If Qbin 13 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
52	Cells discarded by Qbin13	—	—	Provides a count of the cells that are discarded on Qbin 13. If Qbin 13 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
53	Cells transmitted by Qbin13	—	—	Provides a count of the cells that are transmitted by Qbin 13. If Qbin 13 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
54	Cells received by Qbin14	—	—	Provides a count of the cells that are received on Qbin 14. If Qbin 14 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
55	Cells discarded by Qbin14	—	—	Provides a count of the cells that are discarded on Qbin 14. If Qbin 14 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
56	Cells transmitted by Qbin14	—	—	Provides a count of the cells that are transmitted by Qbin 14. If Qbin 14 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
57	Cells received by Qbin15	—	—	Provides a count of the cells that are received on Qbin 15. If Qbin 15 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
58	Cells discarded by Qbin15	—	—	Provides a count of the cells that are discarded on Qbin 15. If Qbin 15 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1) cells
59	Cells transmitted by Qbin15	—	—	Provides a count of the cells that are transmitted by Qbin 15. If Qbin 15 is not assigned a traffic service, the count returns a value of 0. Range: 0 to (2^{40}–1)
61	CLP0 cells transmitted (Ingress)	—	Ingress	Provides a count of the cells with CLP equal to 0 that are transmitted from the port. Range: 0 to (2^{40}–1) cells
62	CLP1 cells transmitted (Ingress)	—	Ingress	Provides a count of the total cells with CLP equal to 1 that are transmitted from the port. Range: 0 to (2^{40}–1) cells
63	OAM cells transmitted (Ingress)	No	Ingress	Provides a count of the OAM cells that are transmitted from the port. Range: 0 to (2^{40}–1) cells
64	RM cells transmitted (Ingress)	No	Ingress	Provides a count of the RM cells that are transmitted from the port. Range: 0 to (2^{40}–1) cells
65	CLP0 cells not discarded due to congestion	No	Ingress	Provides a count of the cells with CLP equal to 0 that are received at the port. Range: 0 to (2^{40}–1) cells
66	CLP1 cells not discarded due to congestion	No	Ingress	Provides a count of the cells with CLP equal to 1 that are received at the port. Range: 0 to (2^{40}–1) cells
67	CLP0 cells discarded due to congestion	No	Ingress–1	Provides a count of the cells with CLP equal to 0 that are received at the port then discarded due to congestion. Range: 0 to (2^{40}–1) cells
68	CLP1 cells discarded due to congestion	No	Ingress–1	Provides a count of the cells with CLP equal to 1 that are received at the port then discarded due to congestion. Range: 0 to (2^{40}–1) cells
69	OAM cells received (Ingress)	No	Ingress–1	Provides a count of the OAM cells that are received at the port. Range: 0 to (2^{40}–1) cells

Table D-18 AXSM-E Port Statistics—Descriptions (continued)

Stat ID	AXSM-E Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
70	RM cells received (Ingress)	No	Ingress–1	Provides a count of the RM cells that are received at the port. Range: 0 to (2^{40}–1) cells
71	EFCI cells transmitted (Ingress)	No	Egress–13	Provides a count of the cells with the explicit forward congestion indication (EFCI) bit set that are transmitted to the port. Range: 0 to (2^{40}–1) cells
72	EFCI cells received (Ingress)	No	Ingress–1	Provides a count of the cells with the EFCI bit set that are received at the port. Range: 0 to (2^{40}–1) cells

D.3.3 VXSM Port Statistics

This section provides information about the statistics contained in the VXSM ATM Port group. The VXSM port statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-19 lists the attributes that are common to all of the VXSM port statistics.

Table D-19 Attributes Common to all VXSM Port Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	3
Subobject Type	15
Default Peak Interval	300 seconds

The VXSM port statistics are used primarily for gathering troubleshooting and performance data.

Table D-20 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-20 VXSM Port Statistics—Descriptions

Stat ID	VXSM Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Ingress CLP0 cells transmitted	—	Ingress	Provides a count of the ingress cells with CLP equal to 0 that are transmitted. Range: 0 to (2^{64}–1)
1	Ingress CLP1 cells transmitted	—	Ingress	Provides a count of the ingress cells with CLP equal to 1 that are transmitted. Range: 0 to (2^{64}–1)
2	Egress CLP0 cells not discarded to congestion	—	Egress	Provides a count of the egress cells with CLP equal to 0 that are not discarded due to congestion. Range: 0 to (2^{64}–1)
3	Egress CLP1 cells not discarded to congestion	—	Egress	Provides a count of the egress cells with CLP equal to 1 that are not discarded due to congestion. Range: 0 to (2^{64}–1)
4	Egress CLP0 cells discarded due to congestion	—	Egress	Provides a count of the egress cells with CLP equal to 0 that are discarded due to congestion. Range: 0 to (2^{64}–1)
5	Egress CLP1 cells discarded due to congestion	—	Egress	Provides a count of the egress cells with CLP equal to 1 that are discarded due to congestion. Range: 0 to (2^{64}–1)

D.4 Card Statistics

The following card statistics are supported:

- D.4.1 AXSM Card Statistics

D.4.1 AXSM Card Statistics

This section provides information about the statistics contained in the AXSM_ATM_card group. The AXSM card statistics are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-21 lists the attributes that are common to the AXSM card statistics.

Table D-21 Attributes Common to all AXSM Card Statistics

Object	Attribute
Front Cards	MGX-AXSM-16-T3E3, MGX-AXSM-16-155, MGX-AXSM-4-622, MGX-AXSM-1-2488
Back Cards	MGX-SMB-8-T3, MGX-SMB-8-E3, MGX-SMB-4-155, MGX-SMFIR-8-155, MGX-SMFLR-8-155, MGX-MMF-8-155, MGX-SMFLR-2-622, MGX-SMFIR-2-622, MGX-SMFSR-1-2488, MGX-SMFLR-1-2488, MGX-SMFXLR-1-2488
Object Type	4
Subobject Type	0
Default Peak Interval	300 seconds

The AXSM card statistics are used primarily for gathering performance data.

Table D-22 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-22 AXSM Card Statistics—Descriptions

Stat ID	AXSM Card Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Cells to backplane - QLSI	No	Ingress–4, 10	Provides a count of the cells that are sent to the bus. Range: 0 to (2^{40}–1) cells
1	Cells from queue (from QE48)	No	Ingress–4, 10	Provides a count of the cells traveling from the queueing engine to the bus. Range: 0 to (2^{40}–1) cells
2	Cells from backplane - QLSI	No	Egress–5, 11	Provides a count of the cells that are received from the bus. Range: 0 to (2^{40}–1) cells
3	CLP0 Cells dropped due to congestion	No	Ingress–3, 9 Egress–6, 12	Provides a count of the cells with cell loss priority (CLP) equal to 0 that are discarded due to congestion or buffer management by the queueing engine. Range: 0 to (2^{40}–1) cells
4	CLP1 Cells dropped due to congestion	No	Ingress–3, 9 Egress–6, 12	Provides a count of the cells with CLP equal to 1 that are dropped due to congestion or buffer management by the queueing engine. Range: 0 to (2^{40}–1) cells

Table D-22 AXSM Card Statistics—Descriptions (continued)

Stat ID	AXSM Card Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
5	Undefined Cells from port	No	Ingress–3, 9 Egress–6, 12	Provides a count of the undefined cells from the queuing engine. An undefined cell can be routed, but it might not be discarded. The queueing engine can not distinguish between payload or operation, administration, and maintenance (OAM) cells. Range: 0 to (2^{40}–1) cells
6	Errored OAM Cells from port	No	Ingress–3, 9 Egress–6, 12	Provides a count of OAM cells that have cyclic redundancy check (CRC) errors. Range: 0 to (2^{40}–1) cells
7	Invalid OAM Cells from port	No	Ingress–3, 9 Egress–6, 12	Provides a count of OAM cells with a bad cell or function type that the queueing engine is unable to decode. Range: 0 to (2^{40}–1) cells
8	Unsupported OAM Cells from port	No	Ingress–3, 9 Egress–6, 12	Provides a count of unsupported OAM cells. These cells are discarded at the queuing engine. Range: 0 to (2^{40}–1) cells
9	Errored RM Cells from port	No	Ingress–3, 9 Egress–6, 12	Provides a count of resource management (RM) cells that have CRC errors. Range: 0 to (2^{40}–1) cells

D.5 Path Statistics

The following path statistics are supported:

- D.5.1 VXSM STS Path Statistics
- D.5.2 VXSM DS3 Path Statistics
- D.5.3 VXSM DS1 N DS3 Path Statistics
- D.5.4 VXSM DS1 VT Path Statistics

D.5.1 VXSM STS Path Statistics

This section provides information about the statistics contained in the VXSM_STS Path group. The VXSM STS path statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-23 lists the attributes that are common to all of the VXSM path statistics.

Table D-23 Attributes Common to all VXSM Path Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	6
Subobject Type	2
Default Peak Interval	300 seconds

Table D-24 includes the description of each statistic.

Table D-24 VXSM STS Path Statistics—Descriptions

Stat ID	VXSM Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Sonet Path AIS	—	—	Provides a count of the alarm indication signal (AIS) instances on the path. Range: 0 to (2^{64}–1)
1	Sonet Path RDI	—	—	Provides a count of the remote defect indications (RDIs)/yellow alarms that occur on the path. Range: 0 to (2^{64}–1)
2	Loss of Pointer	—	—	Provides a count of the loss of pointer (LOP) defect states. Range: 0 to (2^{64}–1)
3	Trace path	—	—	Provides a count of the trace paths. Range: 0 to (2^{64}–1)
4	Code Violations for Path	—	—	Provides a count of the code violations (CVs) for the path. Range: 0 to (2^{64}–1)
5	Errored seconds for path	—	—	Provides a count of the errored seconds (ES) for the path. Range: 0 to (2^{64}–1)
6	Severely errored seconds for path	—	—	Provides a count of the severely errored seconds (SES) for the path. Range: 0 to (2^{64}–1)
7	Unavailable seconds for path	—	—	Provides a count of the unavailable seconds for the path. Range: 0 to (2^{64}–1)

D.5.2 VXSM DS3 Path Statistics

This section provides information about the statistics contained in the VXSM_DS3 Path group. The VXSM DS3 path statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-25 lists the attributes that are common to all of the VXSM DS3 path statistics.

Table D-25 Attributes Common to all VXSM DS3 Path Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	6
Subobject Type	3
Default Peak Interval	300 seconds

Table D-26 includes the description of each statistic.

Table D-26 VXSM DS3 Path Statistics—Descriptions

Stat ID	VXSM DS3 Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	LOF count	—	—	Provides a count of the loss of frames (LOFs) on the DS3 path. Range: 0 to (2^{64}–1)
1	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS3 path. Range: 0 to (2^{64}–1)
2	Remote Defect Count	—	—	Provides a count of the remote defect indications (RDIs)/yellow alarms that occur on the DS3 path. Range: 0 to (2^{64}–1)
3	P-bit Code Violations for Path	—	—	Provides a count of the P-bit code violations (CVs) for the DS3 path. Range: 0 to (2^{64}–1)
4	C-bit Code Violations for Path	—	—	Provides a count of the C-bit code violations (CVs) for the DS3 path. Range: 0 to (2^{64}–1)
144	FEBE Counts	—	—	Provides a count of the FEBEs (far-end block errors) that are encountered by the DS3 path. Range: 0 to (2^{32}–1)

Table D-26 VXSM DS3 Path Statistics—Descriptions (continued)

Stat ID	VXSM DS3 Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
6	P-bit Errored Seconds for Path	—	—	Provides a count of the errored seconds (ES) for the DS3 path. Range: 0 to (2^{64}–1)
7	C-bit Errored Seconds for Path	—	—	Provides a count of the errored seconds (ES) for the DS3 path. Range: 0 to (2^{64}–1)
8	P-bit Severely Errored Seconds for Path	—	—	Provides a count of the severely errored seconds (SES) for the DS3 path. Range: 0 to (2^{64}–1)
9	C-bit Severely Errored Seconds for Path	—	—	Provides a count of the severely errored seconds (SES) for the DS3 path. Range: 0 to (2^{64}–1)
10	Severely Errored Framing Seconds for DS3 Path	—	—	Provides a count of the severely errored framing seconds (SEFS) for the DS3 path. Range: 0 to (2^{64}–1)
11	Unavailable Seconds for DS3 Path	—	—	Provides a count of the unavailable seconds for the DS3 path. Range: 0 to (2^{64}–1)

D.5.3 VXSM DS1 N DS3 Path Statistics

This section provides information about the statistics contained in the VXSM_DS1 N DS3 Path group. The VXSM DS1 N DS3 path statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-27 lists the attributes that are common to all of the VXSM DS1 N DS3 path statistics.

Table D-27 Attributes Common to all VXSM DS1 N DS3 Path Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	6
Subobject Type	4
Default Peak Interval	300 seconds

Table D-28 includes the description of each statistic.

Table D-28 VXSM DS1 N DS3 Path Statistics—Descriptions

Stat ID	VXSM DS1 N DS3 Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Errored Seconds for Path	—	—	Provides a count of the errored seconds (ES) for the DS1 path. Range: 0 to (2^{64}–1)
1	Severely errored seconds for path	—	—	Provides a count of the severely errored seconds (SES) for the DS1 path. Range: 0 to (2^{64}–1)
2	Severely errored framing seconds for path	—	—	Provides a count of the SEFS for the DS1 path. Range: 0 to (2^{64}–1)
3	Unavailable seconds for path	—	—	Provides a count of the unavailable seconds for the DS1 path. Range: 0 to (2^{64}–1)
4	Code Violations for Path	—	—	Provides a count of the code violations (CVs) for the DS1 path. Range: 0 to (2^{64}–1)
5	Errored Seconds for line	—	—	Provides a count of the errored seconds (ES) for the DS1 path. Range: 0 to (2^{64}–1)
6	Severely errored seconds for line	—	—	Provides a count of the severely errored seconds (SES) for the DS1 path. Range: 0 to (2^{64}–1)
7	Severely errored framing seconds for line	—	—	Provides a count of the SEFS for the DS1 path. Range: 0 to (2^{64}–1)
8	Losses of Signal	—	—	Provides a count of the times a loss of signal (LOS) is detected. The count includes the number of LOS alarms. Range: 0 to (2^{64}–1)
9	LOF count	—	—	Provides a count of the loss of frames (LOFs) on the DS1 path. Range: 0 to (2^{64}–1)
10	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS1 path. Range: 0 to (2^{64}–1)

Table D-28 VXSM DS1 N DS3 Path Statistics—Descriptions (continued)

Stat ID	VXSM DS1 N DS3 Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
11	Errored seconds for DS1 path at far end	—	—	Provides a count of the ES for the DS1 path at the far end. Range: 0 to (2^{64}–1)
12	Severely errored seconds for DS1 path at far end	—	—	Provides a count of the SES for the DS1 path at the far end. Range: 0 to (2^{64}–1)
13	Severely errored framing seconds for DS1 path at far end	—	—	Provides a count of the SEFS for the DS1 path at the far end. Range: 0 to (2^{64}–1)
14	Unavailable seconds for DS1 path at far end	—	—	Provides a count of the unavailable seconds for the DS1 path at the far end. Range: 0 to (2^{64}–1)
15	Severely errored seconds for DS1 line at far end	—	—	Provides a count of the SES for the DS1 line at the far end. Range: 0 to (2^{64}–1)
16	Code violations for DS1 path at far end	—	—	Provides a count of the code violations for the DS1 path at the far end. Range: 0 to (2^{64}–1)
17	Code Violations for line	—	—	Provides a count of the code violations (CVs) for the DS1 line. Range: 0 to (2^{64}–1)
18	LOF count	—	—	Provides a count of the loss of frames (LOFs) on the DS1 path. Range: 0 to (2^{64}–1)
19	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS1 path. Range: 0 to (2^{64}–1)
20	Remote Defect Count	—	—	Provides a count of the remote defect indications (RDIs)/yellow alarms that occur on the DS1 path. Range: 0 to (2^{64}–1)
21	Bursty Errored Seconds for Path	—	—	Provides a count of the bursty errored seconds (BES) for the DS1 path. Range: 0 to (2^{64}–1)

Table D-28 VXSM DS1 N DS3 Path Statistics—Descriptions (continued)

Stat ID	VXSM DS1 N DS3 Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
22	Degraded Minutes	—	—	Provides a count of the degraded minutes (60-second periods where the cumulative errors exceed 1E-6 but does not exceed 1E-3) for the DS1 path. Range: 0 to (2^{64}–1)
21	Controlled Slip Seconds for Path	—	—	Provides a count of the controlled slip seconds (CSS) for the DS1 path. A Controlled Slip is the replication or deletion of the payload bits of a DS1 frame. A Controlled Slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal. A Controlled Slip does not cause an Out of Frame defect. Range: 0 to (2^{64}–1)

D.5.4 VXSM DS1 VT Path Statistics

This section provides information about the statistics contained in the VXSM_DS1 VT Path group. The VXSM DS1 VT path statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-29 lists the attributes that are common to all of the VXSM DS1 VT path statistics.

Table D-29 Attributes Common to all VXSM DS1 VT Path Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	6
Subobject Type	5
Default Peak Interval	300 seconds

Table D-30 includes the description of each statistic.

Table D-30 VXSM DS1 VT Path Statistics—Descriptions

Stat ID	VXSM DS1 VT Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Errored Seconds for Path	—	—	Provides a count of the errored seconds (ES) for the DS1 path. Range: 0 to (2^{64}–1)
1	Severely errored seconds for path	—	—	Provides a count of the severely errored seconds (SES) for the DS1 path. Range: 0 to (2^{64}–1)
2	Severely errored framing seconds for path	—	—	Provides a count of the SEFS for the DS1 path. Range: 0 to (2^{64}–1)
3	Unavailable seconds for path	—	—	Provides a count of the unavailable seconds for the DS1 path. Range: 0 to (2^{64}–1)
4	Code Violations for Path	—	—	Provides a count of the code violations (CVs) for the DS1 path. Range: 0 to (2^{64}–1)
5	Errored Seconds for line	—	—	Provides a count of the errored seconds (ES) for the DS1 path. Range: 0 to (2^{64}–1)
6	Severely errored seconds for line	—	—	Provides a count of the severely errored seconds (SES) for the DS1 path. Range: 0 to (2^{64}–1)
7	Severely errored framing seconds for line	—	—	Provides a count of the SEFS for the DS1 path. Range: 0 to (2^{64}–1)
8	Losses of Signal	—	—	Provides a count of the times a loss of signal (LOS) is detected. The count includes the number of LOS alarms. Range: 0 to (2^{64}–1)
9	LOF count	—	—	Provides a count of the loss of frames (LOFs) on the DS1 path. Range: 0 to (2^{64}–1)
10	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS1 path. Range: 0 to (2^{64}–1)

Table D-30 VXSM DS1 VT Path Statistics—Descriptions (continued)

Stat ID	VXSM DS1 VT Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
11	Errored seconds for DS1 path at far end	—	—	Provides a count of the ES for the DS1 path at the far end. Range: 0 to (2^{64}–1)
12	Severely errored seconds for DS1 path at far end	—	—	Provides a count of the SES for the DS1 path at the far end. Range: 0 to (2^{64}–1)
13	Severely errored framing seconds for DS1 path at far end	—	—	Provides a count of the SEFS for the DS1 path at the far end. Range: 0 to (2^{64}–1)
14	Unavailable seconds for DS1 path at far end	—	—	Provides a count of the unavailable seconds for the DS1 path at the far end. Range: 0 to (2^{64}–1)
15	Severely errored seconds for DS1 line at far end	—	—	Provides a count of the SES for the DS1 line at the far end. Range: 0 to (2^{64}–1)
16	Code violations for DS1 path at far end	—	—	Provides a count of the code violations for the DS1 path at the far end. Range: 0 to (2^{64}–1)
17	Code Violations for line	—	—	Provides a count of the code violations (CVs) for the DS1 line. Range: 0 to (2^{64}–1)
18	LOF count	—	—	Provides a count of the loss of frames (LOFs) on the DS1 path. Range: 0 to (2^{64}–1)
19	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS1 path. Range: 0 to (2^{64}–1)
20	Remote Defect Count	—	—	Provides a count of the remote defect indications (RDIs)/yellow alarms that occur on the DS1 path. Range: 0 to (2^{64}–1)
21	Bursty Errored Seconds for Path	—	—	Provides a count of the bursty errored seconds (BES) for the DS1 path. Range: 0 to (2^{64}–1)

Table D-30 VXSM DS1 VT Path Statistics—Descriptions (continued)

Stat ID	VXSM DS1 VT Path Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
22	Degraded Minutes	—	—	Provides a count of the degraded minutes (60-second periods where the cumulative errors exceed 1E-6 but does not exceed 1E-3) for the DS1 path. Range: 0 to (2^{64}–1)
21	Controlled Slip Seconds for Path	—	—	Provides a count of the controlled slip seconds (CSS) for the DS1 path. A Controlled Slip is the replication or deletion of the payload bits of a DS1 frame. A Controlled Slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal. A Controlled Slip does not cause an Out of Frame defect. Range: 0 to (2^{64}–1)

D.6 PNNI Network Statistics

The following PNNI network statistics are supported:

- D.6.1 PNNI Nodal Statistics
- D.6.2 PNNI Port Statistics

D.6.1 PNNI Nodal Statistics

This section provides information about contained in the PNNI_Nodal_Level group. The PNNI node statistics are applicable to the Cisco MGX 8950, Cisco MGX 8850 PXM45-based, Cisco MGX 8850 PXM1E-based, and Cisco MGX 8830 switches.

Table D-31 lists the attributes that are common to the PNNI node statistics.

Table D-31 Attributes Common to all PNNI Node Statistics

Object	Attribute
Front Cards	PXM45, PXM1E-16T1E1
Back Cards	16 Port T1E1 RJ48, 16 Port E1 MCC
Object Type	7
Subobject Type	0
Collection Interval	15 minutes
Default Peak Interval	Not supported

The PNNI node statistics are used for gathering information about SPVCs and SPVPs.

Note To collect PNNI SPVC and SPVP statistics in Cisco MGM, first enable the statistics on the switch by executing the CLI command **cnfpnstat**.

Table D-32 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-32 PNNI Node Statistics—Descriptions

Stat ID	PNNI Node Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Con success at orig node	—	—	Provides a count of the successful connections at the originating node.
1	Con failed at orig node	—	—	Provides a count of the failed connections at the originating node.

D.6.2 PNNI Port Statistics

This section provides information about statistics contained in the PNNI_Port_Level group. The PNNI port statistics are applicable to the Cisco MGX 8950, Cisco MGX 8850 PXM45-based, Cisco MGX 8850 PXM1E-based, and Cisco MGX 8830 switches.

Table D-33 lists the attributes that are common to the PNNI port statistics.

Table D-33 Attributes Common to all PNNI Port Statistics

Object	Attribute
Front Cards	PXM45, PXM1E-16T1E1
Back Cards	16 Port T1E1 RJ48, 16 Port E1 MCC
Object Type	7
Subobject Type	1
Collection Interval	15 minutes
Default Peak Interval	Not supported

The PNNI port statistics are used for gathering information about SPVCs and SPVPs.

Note To collect PNNI SPVC and SPVP statistics in Cisco MGM, first enable the statistics on the switch by executing the CLI command **cnfpnstat**.

Table D-34 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-34 PNNI Port Statistics—Descriptions

Stat ID	PNNI Port Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Con success at orig node	—	—	Provides a count of the successful connections at the originating node.
1	Con failed at orig node	—	—	Provides a count of the failed connections at the originating node.
2	Received crankback at orig node	—	—	Provides a count of the crankbacks at the originating node.
3	Initiate Crankback	—	—	Provides a count of the crankbacks that are initiated.
4	Con success at border node	—	—	Provides a count of the successful connections at the border node.
5	Con failed at border node	—	—	Provides a count of the failed connections at the boarder node.
6	Received crankback at border node	—	—	Provides a count of the crankbacks at the boarder node.

D.7 Protocol Statistics

The following protocol statistics are supported:

- D.7.1 VXSM Megaco Statistics
- D.7.2 VXSM Megaco Physical Termination Protocol Statistics
- D.7.3 VXSM Megaco Ephemeral Termination Protocol Statistics
- D.7.4 VXSM LAPD Protocol Statistics

D.7.1 VXSM Megaco Statistics

This section provides information about the statistics contained in the VXSM_PROTO_MEGACO_GATEWAY group. The VXSM megaco statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Note H.248, also known as the Megaco protocol, is the international standard for media gateway control.

Table D-35 lists the attributes that are common to all of the VXSM card statistics.

Table D-35 Attributes Common to all VXSM Card Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155

Table D-35 Attributes Common to all VXSM Card Statistics (continued)

Object	Attribute
Object Type	8
Subobject Type	0
Default Peak Interval	300 seconds

Table D-36 includes the VXSM megaco statistics.

Table D-36 VXSM Megaco Path Statistics—Descriptions

Stat ID	VXSM Megaco Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Total messages received	—	—	Provides a count of the total ingress cells. Range: 0 to (2^{64}–1)
1	Total messages transmitted	—	—	Provides a count of the ingress cells with cell loss priority (CLP) equal to 0 that are received prior to policing. Range: 0 to (2^{64}–1)
2	signaling-level errors	—	—	Provides a count of the ingress cells with cell loss priority (CLP) equal to 1 that are received prior to policing. Range: 0 to (2^{64}–1)
3	timer recovery events	—	—	Provides a count of the CLP0 cells with the explicit forward congestion indication (EFCI) equal to 1. These cells are received from the port. Range: 0 to (2^{64}–1)
4	Total failed ADD commands	—	—	Provides a count of the total number of ADD commands that have failed. Range: 0 to (2^{64}–1)
5	Total successful ADD commands	—	—	Provides a count of the total number of ADD commands that were successful. Range: 0 to (2^{64}–1)
6	Total failed SUBTRACT commands	—	—	Provides a count of the total number of SUBTRACT commands that have failed. Range: 0 to (2^{64}–1)
7	Total successful SUBTRACT commands	—	—	Provides a count of the total number of SUBTRACT commands that were successful. Range: 0 to (2^{64}–1)
8	Total failed MOVE commands	—	—	Provides a count of the total number of MOVE commands that have failed. Range: 0 to (2^{64}–1)

Table D-36 VXSM Megaco Path Statistics—Descriptions (continued)

Stat ID	VXSM Megaco Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
9	Total successful MOVE commands	—	—	Provides a count of the total number of MOVE commands that were successful. Range: 0 to (2^{64}–1)
11	Total failed MODIFY commands	—	—	Provides a count of the total number of MODIFY commands that have failed. Range: 0 to (2^{64}–1)
12	Total successful MODIFY commands	—	—	Provides a count of the total number of MODIFY commands that were successful. Range: 0 to (2^{64}–1)
12	Total failed AUDIT VALUE commands	—	—	Provides a count of the total number of AUDIT VALUE commands that have failed. Range: 0 to (2^{64}–1)
13	Total successful AUDIT VALUE commands	—	—	Provides a count of the total number of AUDIT VALUE commands that were successful. Range: 0 to (2^{64}–1)
14	Total failed AUDIT CAPABILITY commands	—	—	Provides a count of the total number of AUDIT CAPABILITY commands that have failed. Range: 0 to (2^{64}–1)
15	Total successful AUDIT CAPABILITY commands	—	—	Provides a count of the total number of AUDIT CAPABILITY commands that were successful. Range: 0 to (2^{64}–1)
16	Total failed NOTIFY commands	—	—	Provides a count of the total number of NOTIFY commands that have failed. Range: 0 to (2^{64}–1)
17	Total successful NOTIFY commands	—	—	Provides a count of the total number of NOTIFY commands that were successful. Range: 0 to (2^{64}–1)
18	Total failed Service Change commands from the MGC	—	—	Provides a count of the total number of Service Change commands from the MGC that have failed. Range: 0 to (2^{64}–1)
19	Total successful Service Change commands from the MGC	—	—	Provides a count of the total number of Service Change commands from the MGC that were successful. Range: 0 to (2^{64}–1)

Table D-36 VXSM Megaco Path Statistics—Descriptions (continued)

Stat ID	VXSM Megaco Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
20	Total failed Service Change commands from the MGC to the MG	—	—	Provides a count of the total number of Service Change commands from the MGC to the MG that failed in the MGC. Range: 0 to (2^{64}–1)
21	Total successful Service Change commands from the MGC to the MG	—	—	Provides a count of the total number of Service Change commands from the MGC to the MG that were successful in the MGC. Range: 0 to (2^{64}–1)
22	Total allocated contexts	—	—	Provides a count of the total number of contexts allocated Range: 0 to (2^{64}–1)
23	Total freed contexts	—	—	Provides a count of the total number of contexts that have been freed Range: 0 to (2^{64}–1)

D.7.2 VXSM Megaco Physical Termination Protocol Statistics

This section provides information about the statistics contained in the VXSM_PROTO_MEGACO_PHY_TERM group. The VXSM Megaco Physical Termination protocol statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-37 lists the attributes that are common to all of the VXSM protocol statistics.

Table D-37 Attributes Common to all VXSM Protocol Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	8
Subobject Type	1
Default Peak Interval	300 seconds

Table D-38 includes the VXSM Megaco Physical Termination protocol statistics.

Table D-38 VXSM Megaco Physical Termination Protocol Statistics—Descriptions

Stat ID	VXSM Megaco Physical Termination Protocol Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Total physical termination ADD commands	—	—	Provides a count of the total number of ADD commands that have been initiated. Range: 0 to (2^{64}–1)
1	Total failed physical termination ADD commands	—	—	Provides a count of the total number of ADD commands that have failed. Range: 0 to (2^{64}–1)
2	Out of service from MGC	—	Ingress–1	Provides a count of the total number of.out of service messages received from the Media Gateway Controller (MGC). Range: 0 to (2^{64}–1)
3	Out of service from OAM	—	Ingress	Provides a count of the total number of.out of service messages triggered by the OAM process. Range: 0 to (2^{64}–1)

D.7.3 VXSM Megaco Ephemeral Termination Protocol Statistics

This section provides information about the statistics contained in the VXSM_PROTO_MEGACO_EPHE_TERM group. The VXSM Megaco ephemeral termination protocol statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-39 lists the attributes that are common to all of the VXSM card statistics.

Table D-39 Attributes Common to all VXSM Card Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	8
Subobject Type	2
Default Peak Interval	300 seconds

Table D-40 includes the VXSM Megaco ephemeral termination protocol statistics.

Table D-40 VXSM Megaco Ephemeral Termination Protocol Statistics—Descriptions

Stat ID	VXSM Megaco Ephemeral Termination Protocol Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Total ephemeral termination ADD commands	—	—	Provides a count of the total number of ADD commands that have been initiated. Range: 0 to (2^{64}–1)
1	Total failed ephemeral termination ADD commands	—	—	Provides a count of the total number of ADD commands that have failed. Range: 0 to (2^{64}–1)

D.7.4 VXSM LAPD Protocol Statistics

This section provides information about the statistics contained in the VXSM_PROTO_SCTP_GW group. The VXSM LAPD Protocol statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-41 lists the attributes that are common to all of the VXSM card statistics.

Table D-41 Attributes Common to all VXSM Card Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	8
Subobject Type	5
Default Peak Interval	300 seconds

Table D-42 includes the VXSM LAPD Protocol statistics.

Table D-42 VXSM LAPD Protocol Statistics—Descriptions

Stat ID	VXSM LAPD Protocol Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Total information frames received	—	—	Provides a count of the total number of information frames received. Range: 0 to (2^{64}–1)
1	Total information frames transmitted	—	—	Provides a count of the total number of information frames transmitted. Range: 0 to (2^{64}–1)
2	Total receiver ready frames received	—	—	Provides a count of the total number of receiver ready frames received. Range: 0 to (2^{64}–1)

Table D-42 VXSM LAPD Protocol Statistics—Descriptions (continued)

Stat ID	VXSM LAPD Protocol Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
3	Total receiver ready frames transmitted	—	—	Provides a count of the total number of receiver ready frames transmitted. Range: 0 to (2^{64}–1)
4	Total receiver not ready frames received	—	—	Provides a count of the total number of receiver not ready frames received. Range: 0 to (2^{64}–1)
5	Total receiver not ready frames transmitted	—	—	Provides a count of the total number of receiver not ready frames transmitted. Range: 0 to (2^{64}–1)
6	Total Set Asynchronous Balanced mode frames received	—	—	Provides a count of the total number of Set Asynchronous Balanced mode frames received. Range: 0 to (2^{64}–1)
7	Total Set Asynchronous Balanced mode frames transmitted	—	—	Provides a count of the total number of Set Asynchronous Balanced mode frames transmitted. Range: 0 to (2^{64}–1)
8	Total disconnect frames received	—	—	Provides a count of the total number of disconnect frames received. Range: 0 to (2^{64}–1)
9	Total disconnect frames transmitted	—	—	Provides a count of the total number of disconnect frames transmitted. Range: 0 to (2^{64}–1)
10	Total unnumbered acknowledge frames received	—	—	Provides a count of the total number of unnumbered acknowledge frames received. Range: 0 to (2^{64}–1)
11	Total unnumbered acknowledge frames transmitted	—	—	Provides a count of the total number of unnumbered acknowledge frames transmitted. Range: 0 to (2^{64}–1)
12	Total disconnect mode frames received	—	—	Provides a count of the total number of disconnect mode frames received. Range: 0 to (2^{64}–1)
13	Total disconnect mode frames transmitted	—	—	Provides a count of the total number of disconnect mode frames transmitted. Range: 0 to (2^{64}–1)
14	Total frame reject frames received	—	—	Provides a count of the total number of frame reject frames received. Range: 0 to (2^{64}–1)

Table D-42 VXSM LAPD Protocol Statistics—Descriptions (continued)

Stat ID	VXSM LAPD Protocol Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
15	Total frame reject frames transmitted	—	—	Provides a count of the total number of frame reject frames transmitted. Range: 0 to (2^{64}–1)
16	Total exchange ID frames received	—	—	Provides a count of the total number of exchange ID frames received. Range: 0 to (2^{64}–1)
17	Total exchange ID frames transmitted	—	—	Provides a count of the total number of exchange ID frames transmitted. Range: 0 to (2^{64}–1)
18	Total unnumbered information frames received	—	—	Provides a count of the total number of unnumbered information frames received. Range: 0 to (2^{64}–1)
19	Total unnumbered information frames transmitted	—	—	Provides a count of the total number of unnumbered information frames transmitted. Range: 0 to (2^{64}–1)
20	Total reject frames received	—	—	Provides a count of the total number of reject frames received. Range: 0 to (2^{64}–1)
21	Total reject frames transmitted	—	—	Provides a count of the total number of reject frames transmitted. Range: 0 to (2^{64}–1)
22	Total invalid frames received	—	—	Provides a count of the total number of invalid frames received Range: 0 to (2^{64}–1)

D.8 Physical Line Statistics

The following physical line statistics are supported:

- D.8.1 AXSM-E T1/E1 Physical Line
- D.8.2 AXSM-E T3/E3 Physical Line
- D.8.3 AXSM-E SONET Physical Line
- D.8.4 VXSM SONET Physical Line
- D.8.5 VXSM T1E1 Physical Line Statistics

D.8.1 AXSM-E T1/E1 Physical Line

This section provides information about the statistics contained in the AXSME_Phyline_T1E1 group. The AXSM-E T1/E1 physical line statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-43 lists the attributes that are common to the AXSM-E T1/E1 physical line statistics.

Table D-43 Attributes Common to all AXSM-E T1/E1 Physical Line Statistics

Object	Attribute
Front Card	AXSM-16-T1E1-E
Back Cards	RJ48-8-T1-Y, SMB-8-E1
Object Type	11
Subobject Type	3
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E T1/E1 physical line statistics are used primarily for gathering troubleshooting and performance data.

Table D-44 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-44 AXSM-E T1/E1 Physical Line Statistics—Descriptions

Stat ID	AXSM-E T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Errored Seconds	—	—	Provides a count of the line code violation errored seconds. Range: 0 to (2^{32}–1)
1	Severely Errored Seconds	—	—	Provides a count of the line code violation severely errored seconds (SES) that are encountered by the interface. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
2	Severely Errored Framing Seconds	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T1/E1 line. Range: 0 to (2^{40}–1) cells

Table D-44 AXSM-E T1/E1 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
3	Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds on the T1/E1 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
4	Path coding violations	—	—	Provides a count of the path code violations that are encountered by the interface. These violations occur when more than three zeroes in a row are transmitted. Range: 0 to (2^{32}–1)
5	Line Errored Seconds	—	—	Provides a count of the line code violation errored seconds. Range: 0 to (2^{32}–1)
6	Line Severely Errored Seconds	—	—	Provides a count of the line code violation SES that are encountered by the interface. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
7	Path SEF/AIS (PSAS) Encountered	—	—	Provides a count of the severely errored frames or an alarm indication signals (AIS) detected on the T1/E1 line. Range: 0 to (2^{32}–1)
8	Number of occurrences of Loss of Signal	No	Ingress–1	Provides a count of the times a loss of signal (LOS) is detected on the T1/E1 line. The count includes the number of LOS alarms. Range: 0 to (2^{40}–1) cells
9	Number of occurrences of Out of Frame	No	Ingress–1	Provides a count of the times an out of frame (OOF) is detected. The count includes the number of OOF alarms. Range: 0 to (2^{32}–1)
10	Number of occurrences of RAI	No	Ingress–1	Provides a count of the remote alarm indication (RAI) occurrences on the T1/E1 line. Range: 0 to (2^{32}–1)
11	Far-end Errored Seconds	No	Ingress–1	Provides a count of the seconds errors are detected at the far end of the T1/E1 line. Range: 0 to (2^{40}–1) cells

Table D-44 AXSM-E T1/E1 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
12	Far-end severely Errored Seconds	—	—	Provides a count of the far end SES that occur within the collection interval. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
13	Far-end severely Errored Framing Seconds	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T1/E1 line. Range: 0 to (2^{40}–1) cells
14	Far-end Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds at the far end of the T1/E1 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1)
15	Far-end line errored seconds	—	—	Provides a count of the line code violation errored seconds at the far end. Range: 0 to (2^{32}–1)
16	Far-end path coding violations	—	—	Provides a count of the path code violations that are encountered at the far end. These violations occur when more than three zeroes in a row are transmitted. Range: 0 to (2^{32}–1)
17	Line code violations	No	Ingress–1	Provides a count of the line code violations encountered by the T1/E1 line. Range: 0 to (2^{40}–1) cells)

D.8.2 AXSM-E T3/E3 Physical Line

This section provides information about the statistics contained in the AXSME_Phyline_T3E3 group. The AXSM-E T3/E3 physical line statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-45 lists the attributes that are common to the AXSM-E T3/E3 physical line statistics.

Table D-45 Attributes Common to all AXSM-E T3/E3 Physical Line Statistics

Object	Attribute
Front Card	AXSM-16-T3E3-E
Back Cards	SMB-8-T3, SMB-8-E3
Object Type	11

Table D-45 Attributes Common to all AXSM-E T3/E3 Physical Line Statistics (continued)

Object	Attribute
Subobject Type	4
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E T3/E3 physical line statistics are used primarily for gathering troubleshooting and performance data.

Table D-46 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Loss of Signal Occurrences	No	Ingress–1	Provides a count of the times a loss of signal (LOS) is detected on the T3 line. The count includes the number of LOS alarms. Range: 0 to (2^{40}–1) cells
1	Loss of Frame Occurrences	No	Ingress–1	Provides a count of the loss of frames (LOFs) that are encountered by the T3 line. Range: 0 to (2^{40}–1) cells
2	Alarm Indication Signal Occurrences	No	Ingress–1	Provides a count of the alarm indication signal (AIS) instances on the T3 line. Range: 0 to (2^{40}–1) cells
3	Yellow Alarm Occurrences	No	Ingress–1	Provides a count of the times yellow alarms are detected on the T3 line. Range: 0 to (2^{40}–1) cells
4	Number of line code violations	No	Ingress–1	Provides a count of the line code violations encountered by the T3 line. Range: 0 to (2^{40}–1) cells
5	Number of p-bit parity code violations	No	Ingress–1	Provides a count of the P-bit parity codes that do not match the locally calculated parity code on the T3 line. Range: 0 to (2^{40}–1) cells
6	Number of c-bit parity code violations	No	Ingress–1	Provides a count of the C-bit parity code violations that do not match the locally calculated parity code on the T3 line. Range: 0 to (2^{40}–1) cells

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
7	Far end blocked errors	No	Ingress–1	Provides a count of the far end block errors that occur within the collection interval on the T3 line. Range: 0 to (2^{40}–1) cells
8	Seconds with at least one LCV + number of LOS	No	Ingress–1	Provides a count of the seconds with at least one line code violation (LCV) and one LOS on the T3 line. Range: 0 to (2^{40}–1) cells
9	Seconds with at least one PCV + number of LOF	No	Ingress–1	Provides a count of the seconds with at least one parity code violation (PCV) and one LOF on the T3 line. Range: 0 to (2^{40}–1) cells
10	Seconds with at least one CCV + number of LOF	No	Ingress–1	Provides a count of seconds with at least one C-bit code violation and one LOF on the T3 line. Range: 0 to (2^{40}–1) cells
11	Seconds with 45/34(T3)LCV + number of LOS	No	Ingress–1	Provides a count of seconds with 45/34 LCVs and LOSs on the T3 line. Range: 0 to (2^{40}–1) cells
12	Seconds with 44(T3)PCV + number of LOF	No	Ingress–1	Provides a count of the seconds with 44 PCVs and LOFs on the T3 line. Range: 0 to (2^{40}–1) cells
13	Seconds with 44(T3)CCV + number of LOF	No	Ingress–1	Provides a count of the seconds with 44 CCVs and LOFs on the T3 line. Range: 0 to (2^{40}–1) cells
14	Seconds with severely errored framing	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T3 line. Range: 0 to (2^{40}–1) cells
15	Unavailable seconds	No	Ingress–1	Provides a count of the unavailable seconds on the T3 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
16	PLCP Loss of Frames	No	Ingress–1	Provides a count of the loss of frames detected by the physical layer convergence protocol (PLCP) interface on the T3 line. Range: 0 to (2^{40}–1) cells
17	PLCP YEL-LOW	No	Ingress–1	Provides a count of the number of times PLCP yellow defects are detected on the T3 line. Range: 0 to (2^{40}–1) cells

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
18	PLCP bip 8-errors	No	Ingress–1	Provides a count of the PLCP BIP-8 errors on the T3 line. Range: 0 to (2^{40}–1) cells
19	PLCP far end blocked errors	No	Ingress–1	Provides a count of the far end block errors that are encountered by the PLCP interface on the T3 line. Range: 0 to (2^{40}–1) cells
20	Seconds with at least one PLCP bip-8 error	No	Ingress–1	Provides a count of the seconds with at least one PLCP BIP-8 error detected on the T3 line. Range: 0 to (2^{40}–1) cells
21	Seconds with 5 PLCP bip-8 errors n	No	Ingress–1	Provides a count of the seconds with at least five PLCP BIP-8 errors that are detected on the T3 line. Range: 0 to (2^{40}–1) cells
22	Seconds with T3 PLCP far end blocked errors	No	Ingress–1	Provides a count of the seconds with PLCP far end block errors that are detected on the T3 line. Range: 0 to (2^{40}–1) cells
23	Seconds with 5 PLCP FEBE errors + PLCP YEL	No	Ingress–1	Provides a count of the seconds with at least five PLCP far end block errors (FEBE) and yellow defects detected on the T3 line. Range: 0 to (2^{40}–1) cells
24	Seconds with T3 severely errored framing	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T3 line. Range: 0 to (2^{40}–1) cells
25	T3 PLCP unavailable seconds	No	Ingress–1	Provides a count of the unavailable seconds on the T3 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
26	PLCP Framing Errors	No	Ingress–1	Provides a count of the framing errors that are detected by the PLCP interface on the T3 line. Range: 0 to (2^{40}–1) cells
27	PLCP Framing Error Seconds	No	Ingress–1	Provides a count of seconds that framing errors are detected by PLCP interface on the T3 line. Range: 0 to (2^{40}–1) cells
28	PLCP Severely Errored Framing Seconds	No	Ingress–1	Provides a count of the severely errored seconds based on PLCP framing errors detected on the T3 line. Range: 0 to (2^{40}–1) cells

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
29	Occurrences of loss of cell delineation	No	Ingress–1	Provides a count of the loss of cell delineation defect states on the T3 line. Range: 0 to (2^{40}–1) cells
30	T3 far end errored seconds	No	Ingress–1	Provides a count of the seconds errors are detected at the far end of the T3 line. Range: 0 to (2^{40}–1) cells
31	T3 far end severely errored seconds	T3 far end errored seconds	Ingress–1	Provides a count of the severely errored seconds (SES) that occur at the far end of the T3 line. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
32	T3 far end unavailable seconds	No	Ingress–1	Provides a count of the unavailable seconds at the far end of the T3 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
50	loss of signal occurrences	No	Ingress–1	Provides a count of the times a loss of signal (LOS) is detected on the E3 line. The count includes the number of LOS alarms. Range: 0 to (2^{40}–1) cells
51	loss of frame occurrences	No	Ingress–1	Provides a count of the loss of frames (LOFs) that are encountered by the E3 line. Range: 0 to (2^{40}–1) cells
52	alarm indication signal occurrences	No	Ingress–1	Provides a count of the alarm indication signal (AIS) instances on the E3 line. Range: 0 to (2^{40}–1) cells
53	yellow alarms occurrences	No	Ingress–1	Provides a count of the times yellow alarms are detected on the E3 line. Range: 0 to (2^{40}–1) cells
54	loss of cell delineation occurrences	No	Ingress–1	Provides a count of the loss of cell delineation defect states on the E3 line. Range: 0 to (2^{40}–1) cells
55	trail trace byte mismatch	No	Ingress–1	Provides a count of the trail trace byte (TTB) mismatch occurrences on the E3 line. Range: 0 to (2^{40}–1) cells
56	line code violations	No	Ingress–1	Provides a count of the line code violations encountered by the E3 line. Range: 0 to (2^{40}–1) cells

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
57	Seconds with at least one LCV + number of LOS	No	Ingress–1	Provides a count of the seconds with at least one line code violation (LCV) and one loss of signal (LOS) on the E3 line. Range: 0 to (2^{40}–1) cells
58	Seconds with 45/34 (E3) LCV+ number of LOS	No	Ingress–1	Provides a count of seconds with 45/34 LCVs and LOSs on the E3 line. Range: 0 to (2^{40}–1) cells
59	Number of p-bit parity code violations	No	Ingress–1	Provides a count of the P-bit parity codes that do not match the locally calculated parity code on the E3 line. Range: 0 to (2^{40}–1) cells
60	Seconds with at least one PCV + number of LOF	No	Ingress–1	Provides a count of the seconds with at least one parity code violation (PCV) and one loss of frame (LOF) on the E3 line. Range: 0 to (2^{40}–1) cells
61	Seconds with at least one CCV + number of LOF	No	Ingress–1	Provides a count of seconds with at least one C-bit code violation and one LOF on the E3 line. Range: 0 to (2^{40}–1) cells
62	Seconds with severely errored framing	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the E3 line. Range: 0 to (2^{40}–1) cells
63	Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds on the E3 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
64	Far end blocked errors	No	Ingress–1	Provides a count of the far end block errors that occur within the collection interval on the E3 line. Range: 0 to (2^{40}–1) cells
65	Far end errored seconds	No	Ingress–1	Provides a count of the seconds errors are detected at the far end of the E3 line. Range: 0 to (2^{40}–1) cells

Table D-46 AXSM-E T3/E3 Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E T3/E3 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
66	Far end severely errored seconds	Far end errored seconds	Ingress–1	Provides a count of the severely errored seconds (SES) that occur at the far end of the E3 line. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
67	Far end unavailable seconds	No	Ingress–1	Provides a count of the unavailable seconds at the far end of the E3 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1)

D.8.3 AXSM-E SONET Physical Line

This section provides information about the statistics contained in the AXSME_Phyline_SONET group. The AXSM-E SONET physical line statistics in this group are applicable to the Cisco MGX 8850 PXM45-based switch.

Table D-47 lists the attributes that are common to the AXSM-E SONET physical line statistics.

Table D-47 Attributes Common to all AXSM-E SONET Physical Line Statistics

Object	Attribute
Front Cards	AXSM-8-155-E, AXSM-2-622-E
Back Cards	SMB-4-155, SMFLR-4-155, SMFIR-4-155, MMF-4-155, SMFLR-1-622, SMFIR-1-622
Object Type	11
Subobject Type	5
Allowable Peak Intervals	60 seconds, 300 seconds
Default Peak Interval	300 seconds

The AXSM-E SONET physical line statistics are used primarily for gathering troubleshooting and performance data.

Table D-48 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Note AXSM-E statistics are only collected at measurement points 1, 2, and 13.

Table D-48 AXSM-E SONET Physical Line Statistics—Descriptions

Stat ID	AXSM-E SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	LOS defect state occurrences	No	Ingress–1	Provides a count of the times a loss of signal (LOS) is detected on the SONET line. The count includes the number of LOS alarms. Range: 0 to (2^{40}–1) cells
1	LOF defect state occurrences	No	Ingress–1	Provides a count of the loss of frames (LOFs) that are encountered by the SONET line. Range: 0 to (2^{40}–1) cells
2	AIS defect state occurrences	No	Ingress–1	Provides a count of the alarm indication signal (AIS) instances on the SONET line. Range: 0 to (2^{40}–1) cells
3	Yellow Alarm defect state occurrences	No	Ingress–1	Provides a count of the times yellow alarms are detected on the SONET line. Range: 0 to (2^{40}–1) cells
4	Loss of Cell delineation defect occurrences	No	Ingress–1	Provides a count of the loss of cell delineation defect states on the SONET line. Range: 0 to (2^{40}–1) cells
5	Number of instances of Loss of Pointer	No	Ingress–1	Provides a count of the loss of pointer defect states on the SONET line. Range: 0 to (2^{40}–1) cells
6	Number of instances of Path AIS	No	Ingress–1	Provides a count of the AIS instances on the path. Range: 0 to (2^{40}–1) cells
7	Number of instances of Path Yellow	No	Ingress–1	Provides a count of the times yellow alarms are detected on the path. Range: 0 to (2^{40}–1) cells
8	Trace section	No	Ingress–1	Provides a count of the section traces. Range: 0 to (2^{40}–1) cells
9	Trace path	No	Ingress–1	Provides a count of the path traces. Range: 0 to (2^{40}–1) cells
10	Aps_mis	No	Ingress–1	Provides a count of the total automatic protection system (APS) mismatches. Range: 0 to (2^{40}–1) cells
11	Aps_psbf	No	Ingress–1	Provides a count of the protection switching byte failures (PSBFs) that are detected on the SONET line. Range: 0 to (2^{40}–1) cells

Table D-48 AXSM-E SONET Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
12	Aps_chan_mis	No	Ingress–1	Provides a count of the APS channel mismatches that are detected on the SONET line. Range: 0 to (2^{40}–1) cells
13	Aps_mode_mis	No	Ingress–1	Provides a count of the APS mode mismatches that are detected on the SONET line. Range: 0 to (2^{40}–1) cells
14	Aps_fe_prot	No	Ingress–1	Provides a count of the switches to fast Ethernet protocol. Range: 0 to (2^{40}–1) cells
15	Code violations for section	No	Ingress–1	Provides a count of the section code violations. Range: 0 to (2^{40}–1) cells
16	Errored seconds for section	No	Ingress–1	Provides a count of the section errored seconds that occur within the collection interval. Range: 0 to (2^{40}–1) cells
17	Severely Errored seconds for section	No	Ingress–1	Provides a count of the section severely errored seconds that occur within the collection interval. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
18	Unavailable seconds for section	No	Ingress–1	Provides a count of the section unavailable seconds. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
19	Code violations for line	No	Ingress–1	Provides a count of the code violations encountered by the SONET line. Range: 0 to (2^{40}–1) cells
20	Errored seconds for line	No	Ingress–1	Provides a count of the errored seconds that occur within the collection interval on the SONET line. Range: 0 to (2^{40}–1) cells

Table D-48 AXSM-E SONET Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
21	Severely errored seconds for line	No	Ingress–1	Provides a count of the severely errored seconds that occur within the collection interval on the SONET line. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
22	Unavailable seconds for line	No	Ingress–1	Provides a count of the unavailable seconds on the SONET line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
23	Code violations for line at far end	No	Ingress–1	Provides a count of the code violations at the far end of the line. Range: 0 to (2^{40}–1) cells
24	Errored seconds for line at far end	No	Ingress–1	Provides a count of the errored seconds that occur at the far end of the line. Range: 0 to (2^{40}–1) cells
25	Severely Errored seconds for line at far end	No	Ingress–1	Provides a count of the severely errored seconds at the far end of the line. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
26	Unavailable seconds for line at far end	No	Ingress–1	Provides a count of the section unavailable seconds for the line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
27	Code violations for path	No	Ingress–1	Provides a count of the path code violations. Range: 0 to (2^{40}–1) cells
28	Errored seconds for path	No	Ingress–1	Provides a count of the path errored seconds. Range: 0 to (2^{40}–1) cells
29	Severely errored seconds for path	No	Ingress–1	Provides a count of the path severely errored seconds. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells

Table D-48 AXSM-E SONET Physical Line Statistics—Descriptions (continued)

Stat ID	AXSM-E SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
30	Unavailable seconds for path	No	Ingress–1	Provides a count of the path unavailable seconds for the line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
31	Code violations for path at far end	No	Ingress–1	Provides a count of the path code violations at the far end of the line. Range: 0 to (2^{40}–1) cells
32	Errored seconds for path at far end	No	Ingress–1	Provides a count of the path errored seconds that occur at the far end of the line. Range: 0 to (2^{40}–1) cells
33	Severely errored seconds for path at far end	No	Ingress–1	Provides a count of the path severely errored seconds at the far end of the line. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{40}–1) cells
34	Unavailable seconds for path at far end	No	Ingress–1	Provides a count of the path unavailable seconds for the line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1)

D.8.4 VXSM SONET Physical Line

This section provides information about the statistics contained in the VXSM_Phyline_SONET group. The VXSM SONET physical line statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-49 lists the attributes that are common to all of the VXSM SONET physical line statistics.

Table D-49 Attributes Common to all VXSM SONET Physical Line Statistics

Object	Attribute
Front Card	VXSM
Back Card	VXSM-BC-4-155
Object Type	11
Subobject Type	13
Default Peak Interval	300 seconds

Table D-50 includes the VXSM SONET physical line statistics.

Table D-50 VXSM SONET Physical Line Statistics—Descriptions

Stat ID	VXSM SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	LOS defect state occurrences	—	—	Provides a count of the times a loss of signal (LOS) is detected. Range: 0 to (2^{64}–1)
1	LOF defect state occurrences	—	—	Provides a count of the loss of frames (LOFs) that are encountered by a SONET line. Range: 0 to (2^{64}–1)
2	AIS defect state occurrences	—	—	Provides a count of the alarm indication signal (AIS) instances on the line. Range: 0 to (2^{64}–1)
3	Yellow Alarm defect state occurrences	—	—	Provides a count of the remote defect indications (RDIs)/yellow alarms that occur. Range: 0 to (2^{64}–1)
4	Trace Section	—	—	Provides a count of the trace section. Range: 0 to (2^{64}–1)
5	Aps_mis	—	—	Provides a count for K1 and K2 changing. Range: 0 to (2^{64}–1)
6	Aps_psbf	—	—	Provides a count of the APS protected switch byte failures. Range: 0 to (2^{64}–1)
7	Aps_chan_mis	—	—	Provides a count of the APS channel mismatches. Range: 0 to (2^{64}–1)
8	Aps_mode_mis	—	—	Provides a count of the APS mode mismatches (different APS mode from the far-end). Range: 0 to (2^{64}–1)
9	Aps_fe_prot	—	—	Provides a count of the LOS on the protected far-end. Range: 0 to (2^{64}–1)
10	Code violations for section	—	—	Provides a count of the code violations (CVs) for the section. Range: 0 to (2^{64}–1)
11	Errored seconds for section	—	—	Provides a count of the errored seconds (ES) for the section. Range: 0 to (2^{64}–1)

Table D-50 VXSM SONET Physical Line Statistics—Descriptions (continued)

Stat ID	VXSM SONET Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
12	Severely Errored seconds for section	—	—	Provides a count of the severely errored seconds (SES) for the section. Range: 0 to (2^{64}–1)
13	Unavailable seconds for section	—	—	Provides a count of the unavailable seconds for the section. Range: 0 to (2^{64}–1)
14	Code violations for line	—	—	Provides a count of the code violations (CVs) for the line. Range: 0 to (2^{64}–1)
15	Errored seconds for line	—	—	Provides a count of the errored seconds (ES) for the line. Range: 0 to (2^{64}–1)
16	Severely errored seconds for line	—	—	Provides a count of the severely errored seconds (SES) for the line. Range: 0 to (2^{64}–1)
17	Unavailable seconds for line	—	—	Provides a count of the unavailable seconds for the line. Range: 0 to (2^{64}–1)

D.8.5 VXSM T1E1 Physical Line Statistics

This section provides information about the statistics contained in the VXSM T1E1 physical line statistics. The VXSM T1/E1 statistics are applicable to the VXSM cards on the Cisco MGX 8880 PXM45-based nodes and the Cisco MGX 8850 PXM45-based nodes.

Table D-51 lists the attributes that are common to the VXSM T1/E1 statistics.

Table D-51 Attributes Common to all VXSM T1/E1 Statistics

Object	Attribute
Front Cards	VXSM-48T1E1
Back Cards	48 Port T1E1 RJ48, 48 Port E1 MCC
Object Type	11
Subobject Type	14
Default Peak Interval	300 seconds

The VXSM T1/E1 statistics are used primarily for gathering performance data.

Table D-52 includes the description of each statistic and the point during the data flow at which the statistic gathers the appropriate information. Each measurement point refers to the corresponding point in Figure 1.

Table D-52 VXSM T1/E1 Physical Line Statistics—Descriptions

Stat ID	VXSM T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
0	Errored Seconds	—	—	Provides a count of the line code violation errored seconds. Range: 0 to (2^{32}–1)
1	Severely Errored Seconds	—	—	Provides a count of the near end severely errored seconds (SES) that occur within the collection interval. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
2	Severely Errored Framing Seconds	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T1/E1 line. Range: 0 to (2^{40}–1) cells
3	Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds on the T1/E1 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1) cells
4	Path coding violations	—	—	Provides a count of the path code violations that are encountered by the interface. These violations occur when more than three zeroes in a row are transmitted. Range: 0 to (2^{32}–1)
5	No. of occurrences of Out of Frame	No	Ingress–1	Provides a count of the times an out of frame (OOF) is detected. The count includes the number of OOF alarms. Range: 0 to (2^{32}–1)
6	No. of occurrences of RAI	No	Ingress–1	Provides a count of the remote alarm indication (RAI) occurrences on the T1/E1 line. Range: 0 to (2^{32}–1)
7	Far-end Errored Seconds	No	Ingress–1	Provides a count of the seconds errors are detected at the far end of the T1/E1 line. Range: 0 to (2^{40}–1) cells

Table D-52 VXSM T1/E1 Physical Line Statistics—Descriptions (continued)

Stat ID	VXSM T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
8	Far-end severely Errored Seconds	—	—	Provides a count of the far end SES that occur within the collection interval. Severely errored seconds are classified as errored seconds that are greater than the total line bits per second multiplied by 10^{-6}. Range: 0 to (2^{32}–1)
9	Far-end severely Errored Framing Secs	No	Ingress–1	Provides a count of the severely errored framing seconds that occur within the collection interval on the T1/E1 line. Range: 0 to (2^{40}–1) cells
10	Far-end Unavailable Seconds	No	Ingress–1	Provides a count of the unavailable seconds at the far end of the T1/E1 line. Unavailable seconds are defined as 10 contiguous severely errored seconds. Range: 0 to (2^{40}–1)
11	Far-end line errored Seconds	—	—	Provides a count of the line code violation errored seconds at the far end. Range: 0 to (2^{32}–1)
12	Far-end path coding violations	—	—	Provides a count of the path code violations that are encountered at the far end. These violations occur when more than three zeroes in a row are transmitted. Range: 0 to (2^{32}–1)
13	LOF count	—	—	Provides a count of the loss of frames (LOFs). Range: 0 to (2^{64}–1)
14	Remote AIS Count	—	—	Provides a count of the remote alarm indication signal (AIS) instances on the DS1 path. Range: 0 to (2^{64}–1)

Table D-52 VXSM T1/E1 Physical Line Statistics—Descriptions (continued)

Stat ID	VXSM T1/E1 Physical Line Statistics	Subset of Other Statistics	Ingress/Egress Measurement Point	Description
15	Bursty Errored Seconds	—	—	Provides a count of the bursty errored seconds (BES). Range: 0 to (2^{64}–1)
16	Controlled Slip Seconds	—	—	Provides a count of the controlled slip seconds (CSS). A Controlled Slip is the replication or deletion of the payload bits of a DS1 frame. A Controlled Slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal. A Controlled Slip does not cause an Out of Frame defect. Range: 0 to (2^{64}–1)

Real-Time Counters

Real-time counters (RTCs) are available through the Diagnostics Center. When the GUI displays the RTCs, the applicability rules would be evaluated by the Cisco MGM server, and the counters will appear in the GUI only if the counters are applicable for the selected entity.

This appendix includes the following information:

- E.1 AXSM-Card—Supported Real-Time Counters
- E.2 AXSM-DS1-Line—Supported Real-Time Counters
- E.3 AXSM-DS3-Line—Supported Real-Time Counters
- E.4 AXSM-EndPoint-Connection—Supported Real-Time Counters
- E.5 AXSM-Port—Supported Real-Time Counters
- E.6 AXSM-SONET-Line—Supported Real-Time Counters
- E.7 AXSME-Card—Supported Real-Time Counters
- E.8 AXSME-DS1-Line—Supported Real-Time Counters
- E.9 AXSME-DS3-Line—Supported Real-Time Counters
- E.10 AXSME-EndPoint-Connection—Supported Real-Time Counters
- E.11 AXSME-ImaGroup—Supported Real-Time Counters
- E.12 AXSME-ImaLink—Supported Real-Time Counters
- E.13 AXSME-Port—Supported Real-Time Counters
- E.14 AXSME-SONET-Line—Supported Real-Time Counters
- E.15 MGX2-RPM-Card—Supported Real-Time Counters
- E.16 RPM-EndPoint-Connection—Supported Real-Time Counters
- E.17 RPM-ETHERNET-Line—Supported Real-Time Counters
- E.18 RPM-Port—Supported Real-Time Counters
- E.19 RPM-SONET-Line—Supported Real-Time Counters
- E.20 RPM-VirtualPort—Supported Real-Time Counters
- E.21 MGX2-SRM-Card—Supported Real-Time Counters
- E.22 MGX2-SRM-DS3-Line—Supported Real-Time Counters
- E.23 MGX2-SRM-SONET-Line—Supported Real-Time Counters
- E.24 Common/Card-BearerEndPoint—Supported Real-Time Counters

- E.25 Common/Card-RudpSession—Supported Real-Time Counters
- E.26 Common/Card-SrcpPeer—Supported Real-Time Counters
- E.27 Common/Card-XgcpPeer—Supported Real-Time Counters
- E.28 VISM-Card—Supported Real-Time Counters
- E.29 VISM-DS1-Line—Supported Real-Time Counters
- E.30 VISM-EndPoint-Connection—Supported Real-Time Counters
- E.31 VISM-VirtualPort—Supported Real-Time Counters
- E.32 Common/Card-MGMGLink—Supported Real-Time Counters
- E.33 Common/Card-VxsmXgcp—Supported Real-Time Counters
- E.34 Common/Card-VxsmCid—Supported Real-Time Counters
- E.35 Common/Card-RudpSession—Supported Real-Time Counters
- E.36 Common/Card-MGMGLink—Supported Real-Time Counters
- E.37 VXSM-VT-Path—Supported Real-Time Counters
- E.38 VXSM-VirtualPort—Supported Real-Time Counters
- E.39 VXSM-TU-Path—Supported Real-Time Counters
- E.40 VXSM-TUG3-Path—Supported Real-Time Counters
- E.41 VXSM-STS-Path—Supported Real-Time Counters
- E.42 VXSM-STM-Path—Supported Real-Time Counters
- E.43 VXSM-SONET-Line—Supported Real-Time Counters
- E.44 VXSM-EndPoint-Connection—Supported Real-Time Counters
- E.45 VXSM-DS3-Path—Supported Real-Time Counters
- E.46 VXSM-DS1-Path—Supported Real-Time Counters
- E.47 VXSM-DS1-Line—Supported Real-Time Counters
- E.48 VXSM-AU-Path—Supported Real-Time Counters

E.1 AXSM-Card—Supported Real-Time Counters

No Real-Time Counters supported for the AXSM-Card

E.2 AXSM-DS1-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Alarm Statistics—cardFamily EQ VXSM

Table E-1 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-2 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	dsx1CurrentESs	The number of Errored Seconds.
All Versions	SESs	dsx1CurrentSESs	The number of Severely Errored Seconds.
All Versions	SEFSs	dsx1CurrentSEFSs	The number of Severely Errored Framing Seconds.
All Versions	UASs	dsx1CurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs	dsx1CurrentCSSs	The number of Controlled Slip Seconds.
All Versions	PCVs	dsx1CurrentPCVs	The number of Path Coding Violations.
All Versions	LESs	dsx1CurrentLESs	The number of Line Errored Seconds.
cardFcType EQ 602	BESs	dsx1CurrentBESs	The number of Bursty Errored Seconds.
All Versions	LCVs	dsx1CurrentLCVs	The number of Line Code Violations (LCVs).
All Versions	ESs (Far End)	dsx1FarEndCurrentESs	The number of Far End Errored Seconds.
All Versions	SESs (Far End)	dsx1FarEndCurrentSESs	The number of Far End Severely Errored Seconds.
All Versions	SEFSs (Far End)	dsx1FarEndCurrentSEFSs	The number of Far End Severely Errored Framing Seconds.
All Versions	UASs (Far End)	dsx1FarEndCurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs (Far End)	dsx1FarEndCurrentCSSs	The number of Far End Controlled Slip Seconds.
All Versions	LESs (Far End)	dsx1FarEndCurrentLESs	The number of Far End Line Errored Seconds.
All Versions	PCVs (Far End)	dsx1FarEndCurrentPCVs	The number of Far End Path Coding Violations.
cardFcType EQ 602	BESs (Far End)	dsx1FarEndCurrentBESs	The number of Far End Bursty Errored Seconds.

Table E-3 Line Alarm Statistics—cardFamily EQ VXSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	LOS Count	cds1LOSCounts	The number of times the Loss Of Signal defect was detected with or without integrating to LOS alarm.
All Versions	OOF Count	cds1OOFCounts	The number of times the Out of Frame (OOF) was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds1RAICounts	The number of times Yellow Alarms was detected with or without integrating to RAI alarm.
All Versions	FE Count	cds1FECounts	The number of Framing Pattern Errors encountered by the DS1 interface.

E.3 AXSM-DS3-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12
- Line Alarm Statistics
- PLCP Counters—cardFcType not equal to 160

Table E-4 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.

Table E-4 ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-5 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	PESs	dsx3CurrentPESs	The counter associated with the number of P-bit Errored Seconds.
cardFamily not equal to AXSMXG	PSESs	dsx3CurrentPSESs	The counter associated with the number of P-bit Severely Errored Seconds.

Table E-5 Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	SEFSs	dsx3CurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds.
All Versions	UASs	dsx3CurrentUASs	The counter associated with the number of Unavailable Seconds.
cardFamily not equal to AXSMXG	LCVs	dsx3CurrentLCVs	The counter associated with the number of Line Coding Violations.
cardFamily not equal to AXSMXG	PCVs	dsx3CurrentPCVs	The counter associated with the number of P-bit Coding Violations.
cardFamily not equal to AXSMXG	LESs	dsx3CurrentLESs	The number of Line Errored Seconds.
All Versions	CCVs	dsx3CurrentCCVs	The number of C-bit Coding Violations.
All Versions	CESs	dsx3CurrentCESs	The number of C-bit Errored Seconds.
All Versions	CSESs	dsx3CurrentCSESs	The number of C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CESs (Far End)	dsx3FarEndCurrentCESs	The counter associated with the number of Far Far End C-bit Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CSESs (Far End)	dsx3FarEndCurrentCSESs	The counter associated with the number of Far End C-bit Severely Errored Seconds.

Table E-5 Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CCVs (Far End)	dsx3FarEndCurrentCCVs	The counter associated with the number of Far End C-bit Coding Violations reported via the far end block error count.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	UASs (Far End)	dsx3FarEndCurrentUASs	The counter associated with the number of Far End unavailable seconds.

Table E-6 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12

Applicability	Counter Name	MIB Object Name	Description
All Versions	LCVs	cds3LCVCurrent24Hr	The number of LCVs encountered by the line since the start of current 24 hour period.
All Versions	LCVs	cds3LCVCurrent24Hr	The number of LCVs encountered by the line since the start of current 24 hour period.
All Versions	LESs	cds3LESCurrent24Hr	The number LESs encountered by the line since the start of current 24 hour period.
All Versions	PCVs	cds3PCVCurrent24Hr	The number PCVs encountered by the line since the start of current 24 hour period.
All Versions	PESs	cds3PESCurrent24Hr	The number of PESs encountered by the line since the start of current 24 hour period.
All Versions	PSESs	cds3PSESCurrent24Hr	The number of PSESs encountered by the line since the start of current 24 hour period.
All Versions	SEFSs	cds3SEFSCurrent24Hr	The number of SEFSs encountered by the line since the start of the current 24 hour period.

Table E-6 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	UASs	cds3UASCurrent24Hr	The number of UASs encountered by the line since the start of current 24 hour period.
All Versions	CCVs	cds3CCVCurrent24Hr	The number CCVs encounterd by the line since the start of current 24 hour period.
All Versions	CESs	cds3CESCurrent24Hr	The number of CESs encountered by the line since the start of current 24 hour period.
All Versions	CSESs	cds3CSESCurrent24Hr	The number of CSESs encountered by the line since th start of current 24 hour period.
All Versions	LSESs	cds3LSESCurrent24Hr	The number of LSESs (Line severedly errored seconds) encountered by the line since the start of current 24 hour period.

Table E-7 Line Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	LOS Count	cds3RcvLOSCount	The number of times Loss of Signal was detected with or without integrating to LOS alarm.
cardFamily not equal to AXSMXG	OOF Count	cds3RcvOOFCount	The number of times Out of Frame was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds3RAICount	The number of timesRemote Alarm Indication was detected with or without integrating to RAI alarm.
All Versions	CCV Count	cds3CCVCount	The counter associated with the number of C-Bit Coding Violations encountered by a T3/E3 interface.

Table E-7 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FE Count	cds3FECount	The number of Framing Errors encountered by a T3/E3 interface.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	EXZS Count	cds3EXZSCount	The number of Excessive Zeros(EXZ) by a T3/E3 interface. An EXZ is the occurrence of any string of zeros having length equal to or greater than 3 for B3ZS, or any string of zeros having length greater than 4 for HDB3.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	LCV Count	cds3LCVCount	The count of both BPVs(Bipolar Violations) and EXZs(Excessive Zeros) encountered by a T3/E3 interface.An EXZ increments the LCV by one regardless of the length of the zero string.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	PCV Count	cds3PCVCount	This is the count of P-bit Coding Violation(PCV) error event encountered by DS3 interface. For all DS3 applications, a coding violation error event is a P-bit Parity Error(PERR) event. The parity errors occur when the calculated parity in the information bits of the DS3 frame does not match up with an expected parity value.

Table E-7 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	CPE Count	cds3CPECount	The number of C-bit parity errors(CPERR) on a DS3 interface. This value is calculated over noninformation bits in the DS3 frame.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FEBE Count	cds3FEBECount	The number of Far End Block Errors(FEBE) encountered by a T3/E3 interface.These include frame alignment errors, multiframe alignment errors, and C-bit parity errors. These errors are generated by the transmitter at the far end, and indicate that the transmitter,cabling or the upstream node is faulty.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to SRM AND cardFamily not equal to MPSM	AIS Count	cds3RcvAISCount	The number of times Alarm Indication Signals(AIS) were detected. The AIS indicates that an upstream failure has been detected by the far end.

Table E-8 PLCP Counters—cardFcType not equal to 160

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentBIP-8CV	cds3PlcpBip8CVCurrent	The number of BIP-8 code violations (CV) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8CV	cds3PlcpBip8CV24HrBucket	The number of BIP-8 CVs encountered by the line in the last 24 hours.

Table E-8 PLCP Counters—cardFcType not equal to 160 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentBIP-8ES	cds3PlcpBip8ESCurrent	The number of BIP-8 Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8ES	cds3PlcpBip8ES24HrBucket	The number of BIP-8 ES encountered by the line in the last 24 hour.
All Versions	CurrentBIP-8SES	cds3PlcpBip8SESCurrent	The number of BIP-8 Severely Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8SES	cds3PlcpBip8SES24HrBucket	The number of BIP-8 SES encountered by the line in the last 24 hour.
All Versions	CurrentSEFs	cds3PlcpSEFSCurrent	The number of BIP-8 Severely Errored Framing Seconds(SEFS) encountered by the line in the current 15-minute period.
All Versions	Current24HrSEFs	cds3PlcpSEFS24HrBucket	The number of BIP-8 SEFS encountered by the line in the last 24 hour.
All Versions	CurrentUAS	cds3PlcpUASCurrent	The number of Unavailable Seconds(UAS) encountered by the line in the current 15-minute period.
All Versions	Current24HrUAS	cds3PlcpUAS24HrBucket	The number of BIP-8 UAS encountered by the line in the last 24 hour.
cardFamily EQ AXSME	BIP-8 Errors	cds3PlcpRcvBip8Count	The number of of BIP-8 errors encountered by the line.
All Versions	Num Of OOF	cds3PlcpRcvOOFCount	The number of times Out of Frame(OOF) was detected with or without integrating to OOF alarm.
cardFamily EQ AXSM AND cardFamily EQ AXSME	Num of RAI	cds3PlcpRcvRAICount	The number of times Remote Alarm Indication(RAI) was detected with or without integrating to RAI alarm.
cardFamily EQ AXSME	Num of FE Count	cds3PlcpFECount	The number of Framing Errors detected.
cardFamily EQ AXSME	Num of FESec	cds3PlcpFESecCount	The number of Framing Error errored seconds.
cardFamily EQ AXSME	Num of SEFESec	cds3PlcpSEFSecCount	The number of Severely errored Framing error seconds.

Table E-8 PLCP Counters—cardFcType not equal to 160 (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily EQ AXSME	Num of FEBE	cds3PlcpFEBECount	The count of Far End Block Errors (FEBE) detected.
cardFamily EQ AXSME	Num of FEBESec	cds3PlcpFEBESecCount	The number of FEBE errored seconds.
cardFamily EQ AXSME	Num of SEFEBESec	cds3PlcpSEFEBESecCount	The number of Severely errored FEBE seconds.

E.4 AXSM-EndPoint-Connection—Supported Real-Time Counters

This section includes the following information:

- ATM Connection Statistics

Table E-9 ATM Connection Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv CLP0 (Ingress)	cwacsIngRcvCLP0	Ingress Rcv CLP0
All Versions	Rcv CLP1 (Ingress)	cwacsIngRcvCLP1	Ingress Rcv CLP1
All Versions	CLP0 UPC Discard (Ingress)	cwacsIngCLP0UpcDiscard	Ingress CLP0 UPC Discard
All Versions	CLP1 UPC Discard (Ingress)	cwacsIngCLP1UpcDiscard	Ingress CLP1 UPC Discard
All Versions	CLP0 UPC Tagged (Ingress)	cwacsIngCLP0UpcTagged	Ingress CLP0 UPC Tagged
All Versions	Rcv EFCI1 (Ingress)	cwacsIngRcvEFCI1	Ingress Rcv EFCI1
All Versions	Rcv EOF1(Ingress)	cwacsIngRcvEOF1	Ingress Rcv EOF1
All Versions	Queue Depth (Ingress)	cwacsIngVCQueueDepth	Ingress Queue Depth
All Versions	Rcv CLP0 (Egress)	cwacsEgrRcvCLP0	Egress Rcv CLP0
All Versions	Rcv CLP1 (Egress)	cwacsEgrRcvCLP1	Egress Rcv CLP1
All Versions	Rcv EFCI1 (Egress)	cwacsEgrRcvEFCI1	Egress Rcv EFCI1
cardFamily EQ AXSM	Rcv EOF1 (Egress)	cwacsEgrRcvEOF1	Egress Rcv EOF1
All Versions	Queue Depth (Egress)	cwacsEgrVCQueueDepth	Egress Queue Depth

E.5 AXSM-Port—Supported Real-Time Counters

This section includes the following information:

- Port Counters
- Call Statistics—evaluate_isPnPortPresent
- Load Statistics—evaluate_isPnPortPresent
- Signalling Statistics—evaluate_isPnPortPresent

Table E-10 Port Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv CLP0 Cells (Ingress)	caviIngRcvClp0Cells	The number of CLP-0 cells received from network at the traffic management and policing device in ingress direction.
All Versions	Rcv CLP0 Cells (Egress)	caviEgrRcvClp0Cells	The number of CLP-0 cells received from switch at the traffic management and policing device.
All Versions	Rcv CLP1 Cells (Ingress)	caviIngRcvClp1Cells	The number of CLP-1 cells received from network at the traffic management and policing device in ingress direction.
All Versions	Rcv CLP1 Cells (Egress)	caviEgrRcvClp1Cells	The number of CLP-1 cells received from switch at the traffic management and policing device.
All Versions	CLP0 Discarded Cells (Ingress)	caviIngClp0DiscCells	The number of CLP-0 cells discarded due to policing in ingress direction.
All Versions	CLP0 Cells Discarded Cells (Egress)	caviEgrClp0DiscCells	The number of CLP-0 cells discarded due to policing.
All Versions	CLP1 Discarded Cells (Ingress)	caviIngClp1DiscCells	The number of CLP-1 cells discarded due to policing in ingress direction.
All Versions	CLP1 Discarded Cells (Egress)	caviEgrClp1DiscCells	The number of CLP-1 cells discarded due to policing.
All Versions	Xmt CLP0 Cells (Ingress)	caviIngXmtClp0Cells	The number of CLP-0 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt CLP0 Cells (Egress)	caviEgrXmtClp0Cells	The number of CLP-0 cells transmitted to the network after traffic management and policing.

Table E-10 Port Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Xmt CLP1 Cells (Ingress)	caviIngXmtClp1Cells	The number of CLP-1 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt CLP1 Cells (Egress)	caviEgrXmtClp1Cells	The number of CLP-1 cells transmitted to the network after traffic management and policing.

Table E-11 Call Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Call Attempts	cwspInCallAttempts	This object shows the number of incoming Signaling messages (Setup and Add Party) received by the switching node on this interface for Call establishment.
All Versions	In Call Estabs	cwspInCallEstabs	This object shows the number of incoming Signaling Messages (Connect and Add Party Ack) received by the switching node on this interface which marks that a call has been successfully established.
All Versions	In Call Failures	cwspInCallFailures	This object shows the total number of incoming Point-to-Point (p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC call attempts failed on this interface.
All Versions	In Filter Failures	cwspInFilterFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC call attempts which failed due to address filtering on this interface.
All Versions	In Route Failures	cwspInRouteFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MulitPoint(p2mp) SVC/SPVC call attempts on this interface which failed because there was no route to the destination available.

Table E-11 Call Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Resource Failures	cwspInResrcFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MulitPoint(p2mp) SVC/SPVC call attempts on this interface which failed because there were not enough resources as requested in the parameters of the call.
All Versions	In Timer Failures	cwspInTimerFailures	This object shows the number of signaling timers timed out for incoming Point-to-Point(p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC calls on this interface.
All Versions	In Crankbacks	cwspInCrankbacks	This object shows the number of Crankback IEs received on this interface for incoming Point-to-Point(p2p) and Point-to-MultiPoint (p2mp) SVC/SPVC call attempts.
All Versions	Out Call Attempts	cwspOutCallAttempts	This object shows the number of outgoing Signaling messages (Setup and Add Party) on this interface for Call establishment.
All Versions	Out Call Estabs	cwspOutCallEstabs	This object shows the number of outgoing Signaling messages (Connect and Add Party Ack) which mark the call being established on this interface
All Versions	Out Call Failures	cwspOutCallFailures	This object shows the total number of outgoing Signaling messages for Point-to-Point and Point-to-MultiPoint call establishment on this interface which failed.
All Versions	Out Filter Failures	cwspOutFilterFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed the address filtering.
All Versions	Out Route Failures	cwspOutRouteFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed because the route was not available.

Table E-11 Call Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Out Resource Failures	cwspOutResrcFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed because the resource requested was not available.
All Versions	Out Timer Failures	cwspOutTimerFailures	This object shows the number of Signaling timers timed-out on this interface for outgoing signaling messages.
All Versions	Out Crankbacks	cwspOutCrankbacks	This object shows the number of Crankback IEs being sent on this interface for outgoing signaling Release messages. This is generated on the node which generates the Crankback IEs.

Table E-12 Load Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	BW Total	cwspLoadBwTotal	The total bandwidth of the interface.
All Versions	Max BW CBR	cwspLoadMaxBwCbr	The Maximum bandwith for CBR service.
All Versions	Max BW Real-Time VBR	cwspLoadMaxBwRtVbr	The maximum bandwith for real-time VBR service.
All Versions	Max BW Non Real-Time VBR	cwspLoadMaxBwNrtVbr	The maximum bandwith for non-real-time VBR service.
All Versions	Max BW ABR	cwspLoadMaxBwAbr	The maximum bandwith for ABR service.
All Versions	Max BW UBR	cwspLoadMaxBwUbr	The maximum bandwith for UBR service.
All Versions	BW Available	cwspLoadBwAvail	The total available bandwidth of the interface.
All Versions	Available BW CBR	cwspLoadAvlBwCbr	The available bandwith for CBR service.
All Versions	Avaliable BW Real-Time VBR	cwspLoadAvlBwRtVbr	The available bandwith for real-time VBR service.
All Versions	Available BW Non Real-Time VBR	cwspLoadAvlBwNrtVbr	The available bandwith for non-real-time VBR service.
All Versions	Available BW ABR	cwspLoadAvlBwAbr	The available bandwith for ABR service.

Table E-12 Load Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Available BW UBR	cwspLoadAvlBwUbr	The available bandwith for UBR service.
All Versions	Available VCs	cwspLoadVcAvail	The total number of available VCs of the interface.
All Versions	Avaailable VCs CBR	cwspLoadAvlVcCbr	The number of VCs used by CBR service.
All Versions	Available VCs Real-Time VBR	cwspLoadAvlVcRtVbr	The number of VCs used by real-time VBR service.
All Versions	cwspLoadAvlVcNrtVbr	cwspLoadAvlVcNrtVbr	The number of VCs used by non-real-time VBR service.
All Versions	cwspLoadAvlVcAbr	cwspLoadAvlVcAbr	The number of VCs used by ABR service.
All Versions	cwspLoadAvlVcUbr	cwspLoadAvlVcUbr	The number of VCs used by UBR service.
All Versions	cwspLoadCtdCbr	cwspLoadCtdCbr	The cell transfer delay of CBR service.
All Versions	cwspLoadCtdRtVbr	cwspLoadCtdRtVbr	The cell transfer delay of real-time VBR service.
All Versions	cwspLoadCtdNrtVbr	cwspLoadCtdNrtVbr	The cell transfer delay of non-real-time VBR service.
All Versions	cwspLoadCtdAbr	cwspLoadCtdAbr	The cell transfer delay of ABR service.
All Versions	cwspLoadCtdUbr	cwspLoadCtdUbr	The cell transfer delay of UBR service.
All Versions	cwspLoadCdvCbr	cwspLoadCdvCbr	The cell delay variation of CBR service.
All Versions	cwspLoadCdvRtVbr	cwspLoadCdvRtVbr	The cell delay variation of real-time VBR service.
All Versions	cwspLoadCdvNrtVbr	cwspLoadCdvNrtVbr	The cell delay variation of non-real-time VBR service.
All Versions	cwspLoadCdvAbr	cwspLoadCdvAbr	The cell delay variation of ABR service.
All Versions	cwspLoadCdvUbr	cwspLoadCdvUbr	The cell delay variation of UBR service.
All Versions	cwspLoadClr0Cbr	cwspLoadClr0Cbr	The cell loss ratio-0 of CBR service, -1 implies N/A.
All Versions	cwspLoadClr0RtVbr	cwspLoadClr0RtVbr	The cell loss ratio-0 of real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr0NrtVbr	cwspLoadClr0NrtVbr	The cell loss ratio-0 of non-real-time VBR service, -1 implies N/A.

Table E-12 Load Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspLoadClr0Abr	cwspLoadClr0Abr	The cell loss ratio-0 of ABR service, -1 implies N/A.
All Versions	cwspLoadClr0Ubr	cwspLoadClr0Ubr	The cell loss ratio-0 of UBR service, -1 implies N/A.
All Versions	cwspLoadClr01Cbr	cwspLoadClr01Cbr	The cell loss ratio-1 of CBR service, -1 implies N/A.
All Versions	cwspLoadClr01RtVbr	cwspLoadClr01RtVbr	The cell loss ratio-1 of real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr01NrtVbr	cwspLoadClr01NrtVbr	The cell loss ratio-1 of non-real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr01Abr	cwspLoadClr01Abr	The cell loss ratio-1 of ABR service, -1 implies N/A.
All Versions	cwspLoadClr01Ubr	cwspLoadClr01Ubr	The cell loss ratio-1 of UBR service, -1 implies N/A.
All Versions	cwspLoadMinGurCrCbr	cwspLoadMinGurCrCbr	The minimum guaranteed cell rate capacity of CBR service.
All Versions	cwspLoadMinGurCrRtVbr	cwspLoadMinGurCrRtVbr	The minimum guaranteed cell rate capacity of real-time VBR service.
All Versions	cwspLoadMinGurCrNrtVbr	cwspLoadMinGurCrNrtVbr	The minimum guaranteed cell rate capacity of non-real-time VBR service.
All Versions	cwspLoadMinGurCrAbr	cwspLoadMinGurCrAbr	The minimum guaranteed cell rate capacity of ABR service.
All Versions	cwspLoadMinGurCrUbr	cwspLoadMinGurCrUbr	The minimum guaranteed cell rate capacity of UBR service.

Table E-13 Signalling Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspCallProcRcv	cwspCallProcRcv	Number of CALL PROCEEDING messages received on this interface.
All Versions	cwspConnectRcv	cwspConnectRcv	Number of CONNECT messages received on this interface.
All Versions	cwspConnectAckRcv	cwspConnectAckRcv	Number of CONNECT ACK messages received on this interface.
All Versions	cwspSetupRcv	cwspSetupRcv	Number of SETUP messages received on this interface.

Table E-13 Signalling Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspReleaseRcv	cwspReleaseRcv	Number of RELEASE messages received on this interface.
All Versions	cwspReleaseComplRcv	cwspReleaseComplRcv	Number of RELEASE COMPLETE messages received on this interface.
All Versions	cwspRestartRcv	cwspRestartRcv	Number of RESTART messages received on this interface.
All Versions	cwspRestartAckRcv	cwspRestartAckRcv	Number of RESTART ACK messages received on this interface.
All Versions	cwspStatusRcv	cwspStatusRcv	Number of STATUS messages received on this interface.
All Versions	cwspStatusEnqRcv	cwspStatusEnqRcv	Number of STATUS ENQUIRY messages received on this interface.
All Versions	cwspNotifyRcv	cwspNotifyRcv	Number of NOTIFY messages received on this interface.
All Versions	cwspAlertRcv	cwspAlertRcv	Number of ALERT messages received on this interface.
All Versions	cwspProgressRcv	cwspProgressRcv	Number of PROGRESS messages received on this interface.
All Versions	cwspAddPtyRcv	cwspAddPtyRcv	Number of ADD PARTY messages received on this interface.
All Versions	cwspAddPtyAckRcv	cwspAddPtyAckRcv	Number of ADD PARTY ACK messages received on this interface.
All Versions	cwspAddPtyRejRcv	cwspAddPtyRejRcv	Number of ADD PARTY REJECT messages received on this interface.
All Versions	cwspDropPtyRcv	cwspDropPtyRcv	Number of DROP PARTY messages received on this interface.
All Versions	cwspIncorrectMsgRcv	cwspIncorrectMsgRcv	Number of Incorrect messages received on this interface.
All Versions	cwspTimerExpiries	cwspTimerExpiries	Number of timeouts occurred on this interface.
All Versions	cwspLastCause	cwspLastCause	to indicate the last cause of release or cranckback.
All Versions	cwspLastDiagnostic	cwspLastDiagnostic	to indicate the last diagnostic of release or cranckback.

Table E-13 Signalling Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspCallProcXmt	cwspCallProcXmt	Number of CALL PROCEEDING messages transmitted from this interface.
All Versions	cwspConnectXmt	cwspConnectXmt	Number of CONNECT messages transmitted from this interface.
All Versions	cwspConnectAckXmt	cwspConnectAckXmt	Number of CONNECT ACK messages transmitted from this interface.
All Versions	cwspSetupXmt	cwspSetupXmt	Number of SETUP messages transmitted from this interface.
All Versions	cwspReleaseXmt	cwspReleaseXmt	Number of RELEASE messages transmitted from this interface.
All Versions	cwspReleaseComplXmt	cwspReleaseComplXmt	Number of RELEASE COMPLETE messages transmitted from this interface.
All Versions	cwspRestartXmt	cwspRestartXmt	Number of RESTART messages transmitted from this interface.
All Versions	cwspRestartAckXmt	cwspRestartAckXmt	Number of RESTART ACK messages transmitted from this interface.
All Versions	cwspStatusXmt	cwspStatusXmt	Number of STATUS messages transmitted from this interface.
All Versions	cwspStatusEnqXmt	cwspStatusEnqXmt	Number of STATUS ENQUIRY messages transmitted from this interface.
All Versions	cwspNotifyXmt	cwspNotifyXmt	Number of NOTIFY messages transmitted from this interface.
All Versions	cwspAlertXmt	cwspAlertXmt	Number of ALERT messages transmitted from this interface.
All Versions	cwspProgressXmt	cwspProgressXmt	Number of PROGRESS messages transmitted from this interface.
All Versions	cwspAddPtyXmt	cwspAddPtyXmt	Number of ADD PARTY messages transmitted from this interface.
All Versions	cwspAddPtyAckXmt	cwspAddPtyAckXmt	Number of ADD PARTY ACK messages transmitted from this interface.
All Versions	cwspAddPtyRejXmt	cwspAddPtyRejXmt	Number of ADD PARTY REJECT messages transmitted from this interface.

Table E-13 Signalling Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspDropPtyXmt	cwspDropPtyXmt	Number of DROP PARTY messages transmitted from this interface.
All Versions	cwspSscopStatus	cwspSscopStatus	Sscop link status on an NNI interface, object is meaningful along with ciscoWANSscopLinkChange trap.

E.6 AXSM-SONET-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Section Current Counters
- Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Section Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Alarm Statistics

Table E-14 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.

Table E-14 ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	aclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-15 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetLineCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	SESs	sonetLineCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	CVs	sonetLineCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	UASs	sonetLineCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndLineCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndLineCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndLineCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndLineCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-16 Section Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetSectionCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SESs	sonetSectionCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SEFSs	sonetSectionCurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	CVs	sonetSectionCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-17 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.

Table E-17 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-18 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsLineCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsLineCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsLineCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsLineCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
All Versions	ESs (Far End)	cwsFELineCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
All Versions	SESs (Far End)	cwsFELineCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.

Table E-18 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CVs (Far End)	cwsFELineCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
All Versions	UASs (Far End)	cwsFELineCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-19 Section Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsSectionCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsSectionCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	SEFs	cwsSectionCurrent24HrSEFSs	Number of SEFSs encountered in current 24 hour interval.
All Versions	CVs	cwsSectionCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-20 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.

Table E-20 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-21 Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Section LOSs	cssLOSs	The number of Loss of signals(LOS) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Section LOFs	cssLOFs	The number of Loss of Frames (LOF) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Line AISs	cslAISs	The number of alarm indication signals(AIS) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
All Versions	Line RFIs	cslRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.

Table E-21 Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path AISs	cspAISs	The number of alarm indication signals (AIS) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	cspRFIs	cspRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.

E.7 AXSME-Card—Supported Real-Time Counters

No Real-Time Counters supported for the AXSME-Card

E.8 AXSME-DS1-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Alarm Statistics—cardFamily EQ VXSM

Table E-22 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.

Table E-22 ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-23 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	dsx1CurrentESs	The number of Errored Seconds.
All Versions	SESs	dsx1CurrentSESs	The number of Severely Errored Seconds.
All Versions	SEFSs	dsx1CurrentSEFSs	The number of Severely Errored Framing Seconds.
All Versions	UASs	dsx1CurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs	dsx1CurrentCSSs	The number of Controlled Slip Seconds.
All Versions	PCVs	dsx1CurrentPCVs	The number of Path Coding Violations.
All Versions	LESs	dsx1CurrentLESs	The number of Line Errored Seconds.
cardFcType EQ 602	BESs	dsx1CurrentBESs	The number of Bursty Errored Seconds.
All Versions	LCVs	dsx1CurrentLCVs	The number of Line Code Violations (LCVs).
All Versions	ESs (Far End)	dsx1FarEndCurrentESs	The number of Far End Errored Seconds.
All Versions	SESs (Far End)	dsx1FarEndCurrentSESs	The number of Far End Severely Errored Seconds.
All Versions	SEFSs (Far End)	dsx1FarEndCurrentSEFSs	The number of Far End Severely Errored Framing Seconds.
All Versions	UASs (Far End)	dsx1FarEndCurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs (Far End)	dsx1FarEndCurrentCSSs	The number of Far End Controlled Slip Seconds.
All Versions	LESs (Far End)	dsx1FarEndCurrentLESs	The number of Far End Line Errored Seconds.
All Versions	PCVs (Far End)	dsx1FarEndCurrentPCVs	The number of Far End Path Coding Violations.
cardFcType EQ 602	BESs (Far End)	dsx1FarEndCurrentBESs	The number of Far End Bursty Errored Seconds.

Table E-24 Line Alarm Statistics—cardFamily EQ VXSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	LOS Count	cds1LOSCounts	The number of times the Loss Of Signal defect was detected with or without integrating to LOS alarm.
All Versions	OOF Count	cds1OOFCounts	The number of times the Out of Frame (OOF) was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds1RAICounts	The number of times Yellow Alarms was detected with or without integrating to RAI alarm.
All Versions	FE Count	cds1FECounts	The number of Framing Pattern Errors encountered by the DS1 interface.

E.9 AXSME-DS3-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Category—Line Current Counters
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12
- Line Alarm Statistics
- PLCP Counters—cardFcType not equal to 160

Table E-25 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.

Table E-25 ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-26 Category—Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	PESs	dsx3CurrentPESs	The counter associated with the number of P-bit Errored Seconds.
cardFamily not equal to AXSMXG	PSESs	dsx3CurrentPSESs	The counter associated with the number of P-bit Severely Errored Seconds.
cardFamily not equal to AXSMXG	SEFSs	dsx3CurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds.
All Versions	UASs	dsx3CurrentUASs	The counter associated with the number of Unavailable Seconds.
cardFamily not equal to AXSMXG	LCVs	dsx3CurrentLCVs	The counter associated with the number of Line Coding Violations.
cardFamily not equal to AXSMXG	PCVs	dsx3CurrentPCVs	The counter associated with the number of P-bit Coding Violations.
cardFamily not equal to AXSMXG	LESs	dsx3CurrentLESs	The number of Line Errored Seconds.
All Versions	CCVs	dsx3CurrentCCVs	The number of C-bit Coding Violations.
All Versions	CESs	dsx3CurrentCESs	The number of C-bit Errored Seconds.
All Versions	CSESs	dsx3CurrentCSESs	The number of C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CESs (Far End)	dsx3FarEndCurrentCESs	The counter associated with the number of Far Far End C-bit Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CSESs (Far End)	dsx3FarEndCurrentCSESs	The counter associated with the number of Far End C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CCVs (Far End)	dsx3FarEndCurrentCCVs	The counter associated with the number of Far End C-bit Coding Violations reported via the far end block error count.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	UASs (Far End)	dsx3FarEndCurrentUASs	The counter associated with the number of Far End unavailable seconds.

Table E-27 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12

Applicability	Counter Name	MIB Object Name	Description
All Versions	LCVs	cds3LCVCurrent24Hr	The number of LCVs encountered by the line since the start of current 24 hour period.
All Versions	LESs	cds3LESCurrent24Hr	The number LESs encountered by the line since the start of current 24 hour period.
All Versions	PCVs	cds3PCVCurrent24Hr	The number PCVs encountered by the line since the start of current 24 hour period.
All Versions	PESs	cds3PESCurrent24Hr	The number of PESs encountered by the line since the start of current 24 hour period.
All Versions	PSESs	cds3PSESCurrent24Hr	The number of PSESs encountered by the line since the start of current 24 hour period.
All Versions	SEFSs	cds3SEFSCurrent24Hr	The number of SEFSs encountered by the line since the start of the current 24 hour period.
All Versions	UASs	cds3UASCurrent24Hr	The number of UASs encountered by the line since the start of current 24 hour period.
All Versions	CCVs	cds3CCVCurrent24Hr	The number CCVs encounterd by the line since the start of current 24 hour period.
All Versions	CESs	cds3CESCurrent24Hr	The number of CESs encountered by the line since the start of current 24 hour period.
All Versions	CSESs	cds3CSESCurrent24Hr	The number of CSESs encountered by the line since th start of current 24 hour period.
All Versions	LSESs	cds3LSESCurrent24Hr	The number of LSESs (Line severedly errored seconds) encountered by the line since the start of current 24 hour period.

Table E-28 Line Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	LOS Count	cds3RcvLOSCount	The number of times Loss of Signal was detected with or without integrating to LOS alarm.
cardFamily not equal to AXSMXG	OOF Count	cds3RcvOOFCount	The number of times Out of Frame was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds3RAICount	The number of timesRemote Alarm Indication was detected with or without integrating to RAI alarm.
All Versions	CCV Count	cds3CCVCount	The counter associated with the number of C-Bit Coding Violations encountered by a T3/E3 interface.

Table E-28 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FE Count	cds3FECount	The number of Framing Errors encountered by a T3/E3 interface.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	EXZS Count	cds3EXZSCount	The number of Excessive Zeros(EXZ) by a T3/E3 interface. An EXZ is the occurrence of any string of zeros having length equal to or greater than 3 for B3ZS, or any string of zeros having length greater than 4 for HDB3.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	LCV Count	cds3LCVCount	The count of both BPVs(Bipolar Violations) and EXZs(Excessive Zeros) encountered by a T3/E3 interface.An EXZ increments the LCV by one regardless of the length of the zero string.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	PCV Count	cds3PCVCount	This is the count of P-bit Coding Violation(PCV) error event encountered by DS3 interface. For all DS3 applications, a coding violation error event is a P-bit Parity Error(PERR) event. The parity errors occur when the calculated parity in the information bits of the DS3 frame does not match up with an expected parity value.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	CPE Count	cds3CPECount	The number of C-bit parity errors(CPERR) on a DS3 interface. This value is calculated over noninformation bits in the DS3 frame.

Table E-28 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FEBE Count	cds3FEBECount	The number of Far End Block Errors(FEBE) encountered by a T3/E3 interface.These include frame alignment errors, multiframe alignment errors, and C-bit parity errors. These errors are generated by the transmitter at the far end, and indicate that the transmitter,cabling or the upstream node is faulty.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to SRM AND cardFamily not equal to MPSM	AIS Count	cds3RcvAISCount	The number of times Alarm Indication Signals(AIS) were detected. The AIS indicates that an upstream failure has been detected by the far end.

Table E-29 PLCP Counters—cardFcType not equal to 160

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentBIP-8CV	cds3PlcpBip8CVCurrent	The number of BIP-8 code violations (CV) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8CV	cds3PlcpBip8CV24HrBucket	The number of BIP-8 CVs encountered by the line in the last 24 hours.
All Versions	CurrentBIP-8ES	cds3PlcpBip8ESCurrent	The number of BIP-8 Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8ES	cds3PlcpBip8ES24HrBucket	The number of BIP-8 ES encountered by the line in the last 24 hour.
All Versions	CurrentBIP-8SES	cds3PlcpBip8SESCurrent	The number of BIP-8 Severely Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8SES	cds3PlcpBip8SES24HrBucket	The number of BIP-8 SES encountered by the line in the last 24 hour.
All Versions	CurrentSEFs	cds3PlcpSEFSCurrent	The number of BIP-8 Severely Errored Framing Seconds(SEFS) encountered by the line in the current 15-minute period.
All Versions	Current24HrSEFs	cds3PlcpSEFS24HrBucket	The number of BIP-8 SEFS encountered by the line in the last 24 hour.

Table E-29 PLCP Counters—cardFcType not equal to 160 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentUAS	cds3PlcpUASCurrent	The number of Unavailable Seconds(UAS) encountered by the line in the current 15-minute period.
All Versions	Current24HrUAS	cds3PlcpUAS24HrBucket	The number of BIP-8 UAS encountered by the line in the last 24 hour.
cardFamily EQ AXSME	BIP-8 Errors	cds3PlcpRcvBip8Count	The number of of BIP-8 errors encountered by the line.
All Versions	Num Of OOF	cds3PlcpRcvOOFCount	The number of times Out of Frame(OOF) was detected with or without integrating to OOF alarm.
cardFamily EQ AXSM AND cardFamily EQ AXSME	Num of RAI	cds3PlcpRcvRAICount	The number of times Remote Alarm Indication(RAI) was detected with or without integrating to RAI alarm.
cardFamily EQ AXSME	Num of FE Count	cds3PlcpFECount	The number of Framing Errors detected.
cardFamily EQ AXSME	Num of FESec	cds3PlcpFESecCount	The number of Framing Error errored seconds.
cardFamily EQ AXSME	Num of SEFESec	cds3PlcpSEFSecCount	The number of Severely errored Framing error seconds.
cardFamily EQ AXSME	Num of FEBE	cds3PlcpFEBECount	The count of Far End Block Errors (FEBE) detected.
cardFamily EQ AXSME	Num of FEBESec	cds3PlcpFEBESecCount	The number of FEBE errored seconds.
cardFamily EQ AXSME	Num of SEFEBESec	cds3PlcpSEFEBESecCount	The number of Severely errored FEBE seconds.

E.10 AXSME-EndPoint-Connection—Supported Real-Time Counters

This section includes the following information:

- ATM Connection Statistics

Table E-30 ATM Connection Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv CLP0 (Ingress)	cwacsIngRcvCLP0	Ingress Rcv CLP0
All Versions	Rcv CLP1 (Ingress)	cwacsIngRcvCLP1	Ingress Rcv CLP1
All Versions	CLP0 UPC Discard (Ingress)	cwacsIngCLP0UpcDiscard	Ingress CLP0 UPC Discard
All Versions	CLP1 UPC Discard (Ingress)	cwacsIngCLP1UpcDiscard	Ingress CLP1 UPC Discard
All Versions	CLP0 UPC Tagged (Ingress)	cwacsIngCLP0UpcTagged	Ingress CLP0 UPC Tagged

Table E-30 ATM Connection Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv EFCI1 (Ingress)	cwacsIngRcvEFCI1	Ingress Rcv EFCI1
All Versions	Rcv EOF1(Ingress)	cwacsIngRcvEOF1	Ingress Rcv EOF1
All Versions	Queue Depth (Ingress)	cwacsIngVCQueueDepth	Ingress Queue Depth
All Versions	Rcv CLP0 (Egress)	cwacsEgrRcvCLP0	Egress Rcv CLP0
All Versions	Rcv CLP1 (Egress)	cwacsEgrRcvCLP1	Egress Rcv CLP1
All Versions	Rcv EFCI1 (Egress)	cwacsEgrRcvEFCI1	Egress Rcv EFCI1
cardFamily EQ AXSM	Rcv EOF1 (Egress)	cwacsEgrRcvEOF1	Egress Rcv EOF1
All Versions	Queue Depth (Egress)	cwacsEgrVCQueueDepth	Egress Queue Depth

E.11 AXSME-ImaGroup—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- IMA Group Alarm Counters

Table E-31 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.

Table E-31 ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-32 IMA Group Alarm Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Accumulated Delay	cimaGroupAccumulatedDelay	Indicates the amount of data per link that is accumulated in the DCBs of the IMA Group.
All Versions	Running Secs	imaGroupRunningSecs	The amount of time (in seconds) since this IMA group has been in the Operational state.
All Versions	Unavailable Secs	imaGroupUnavailSecs	Count of one second intervals where the IMA Group Traffic State Machine is Down.
All Versions	Near End Num Failures	imaGroupNeNumFailures	The number of times a near-end group failure (Config-Aborted, Insufficient-Links) has been reported since power-up or reboot.
All Versions	Far End Num Failures	imaGroupFeNumFailures	The number of times a far-end group failure (Config-Aborted-FE, Insufficient-Links-FE, Blocked-FE) has been reported since power-up or reboot. This is an optional attribute.

Table E-32 IMA Group Alarm Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Tx Avail Cell rate	imaGroupTxAvailCellRate	The current cell rate (truncated value in cells per second) provided by this IMA group in the transmit direction, considering all the transmit links in the Active state.
All Versions	Rx Avail Cell Rate	imaGroupRxAvailCellRate	The current cell rate (truncated value in cells per second) provided by this IMA group in the receive direction, considering all the receive links in the Active state.

E.12 AXSME-ImaLink—Supported Real-Time Counters

This section includes the following information:

- IMA Link Counters

Table E-33 IMA Link Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	IMA Violations	imaLinkImaViolations	ICP violations: count of errored, invalid or missing ICP cells, except during SES-IMA or UAS-IMA conditions.
All Versions	OIF Anomalies	imaLinkOifAnomalies	The number of OIF anomalies, except during SES-IMA or UAS-IMA conditions, at the near-end. This is an optional attribute.
All Versions	Ne Severely Errored Secs	imaLinkNeSevErroredSecs	Count of one second intervals containing >= 30% of the ICP cells counted as IV-IMAs, or one or more link defects (e.g., LOS, OOF/LOF, AIS, or LCD), LIF defects, or LODS defects, except during UAS-IMA condition.
All Versions	Fe Severely Errored Secs	imaLinkFeSevErroredSecs	Count of one second intervals containing one or more RDI-IMA defects, except during UAS-IMA-FE condition.
All Versions	Ne Unavail Secs	imaLinkNeUnavailSecs	Count of unavailable seconds at near-end: unavailability begins at the onset of 10 contiguous SES-IMA and ends at the onset of 10 contiguous seconds with no SES-IMA.

Table E-33 IMA Link Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Fe Unavail Secs	imaLinkFeUnavailSecs	Count of unavailable seconds at far-end: unavailability begins at the onset of 10 contiguous SES-IMA-FE and ends at the onset of 10 contiguous seconds with no SES-IMA-FE.
All Versions	Ne Tx Unusable Secs	imaLinkNeTxUnusableSecs	Tx Unusable seconds: count of Tx Unusable seconds at the near-end Tx LSM.
All Versions	Ne Rx Unusable Secs	imaLinkNeRxUnusableSecs	Rx Unusable seconds: count of Rx Unusable seconds at the near-end Rx LSM.
All Versions	Fe Tx Unusable Secs	imaLinkFeTxUnusableSecs	Tx Unusable seconds at far-end: count of seconds with Tx Unusable indications from the far-end Tx LSM.
All Versions	Fe Rx Unusable Secs	imaLinkFeRxUnusableSecs	Rx Unusable seconds at far-end: count of seconds with Rx Unusable indications from the far-end Rx LSM.
All Versions	Ne Tx Num Failures	imaLinkNeTxNumFailures	The number of times a near-end transmit failure alarm condition has been entered on this link (i.e., some form of implementation specific transmit fault).
All Versions	Ne Rx Num Failures	imaLinkNeRxNumFailures	The number of times a near-end receive failure alarm condition has been entered on this link (i.e., LIF, LODS, RFI-IMA, Mis-Connected or some form of implementation specific receive fault).
All Versions	Fe Tx Num Failures	imaLinkFeTxNumFailures	The number of times a far-end transmit failure alarm condition has been entered on this link (i.e., Tx-Unusable-FE). This is an optional attribute.
All Versions	Fe Rx Num Failures	imaLinkFeRxNumFailures	The number of times a far-end receive failure alarm condition has been entered on this link (i.e., Rx-Unusable-FE). This is an optional attribute.
All Versions	Tx Stuffs	imaLinkTxStuffs	Count of stuff events inserted in the transmit direction. This is an optional attribute.

Table E-33 IMA Link Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rx Stuffs	imaLinkRxStuffs	Count of stuff events detected in the receive direction. This is an optional attribute.
All Versions	Num Rx ICP Cells	cimaLinkNumRxIcpCells	Number of error-free received ICP cells on this link of the IMA group.

E.13 AXSME-Port—Supported Real-Time Counters

This section includes the following information:

- Port Counters
- Call Statistics—evaluate_isPnPortPresent
- Load Statistics—evaluate_isPnPortPresent
- Signalling Statistics—evaluate_isPnPortPresent
- ATM Cell Layer Counters—cellLayer EQ true

Table E-34 Port Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv CLP0 Cells (Ingress)	caviIngRcvClp0Cells	The number of CLP-0 cells received from network at the traffic management and policing device in ingress direction.
All Versions	Rcv CLP0 Cells (Egress)	caviEgrRcvClp0Cells	The number of CLP-0 cells received from switch at the traffic management and policing device.
All Versions	Rcv CLP1 Cells (Ingress)	caviIngRcvClp1Cells	The number of CLP-1 cells received from network at the traffic management and policing device in ingress direction.
All Versions	Rcv CLP1 Cells (Egress)	caviEgrRcvClp1Cells	The number of CLP-1 cells received from switch at the traffic management and policing device.
All Versions	CLP0 Discarded Cells (Ingress)	caviIngClp0DiscCells	The number of CLP-0 cells discarded due to policing in ingress direction.
All Versions	CLP0 Cells Discarded Cells (Egress)	caviEgrClp0DiscCells	The number of CLP-0 cells discarded due to policing.
All Versions	CLP1 Discarded Cells (Ingress)	caviIngClp1DiscCells	The number of CLP-1 cells discarded due to policing in ingress direction.
All Versions	CLP1 Discarded Cells (Egress)	caviEgrClp1DiscCells	The number of CLP-1 cells discarded due to policing.

Table E-34 Port Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Xmt CLP0 Cells (Ingress)	caviIngXmtClp0Cells	The number of CLP-0 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt CLP0 Cells (Egress)	caviEgrXmtClp0Cells	The number of CLP-0 cells transmitted to the network after traffic management and policing.
All Versions	Xmt CLP1 Cells (Ingress)	caviIngXmtClp1Cells	The number of CLP-1 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt CLP1 Cells (Egress)	caviEgrXmtClp1Cells	The number of CLP-1 cells transmitted to the network after traffic management and policing.

Table E-35 Call Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Call Attempts	cwspInCallAttempts	This object shows the number of incoming Signaling messages (Setup and Add Party) received by the switching node on this interface for Call establishment.
All Versions	In Call Estabs	cwspInCallEstabs	This object shows the number of incoming Signaling Messages (Connect and Add Party Ack) received by the switching node on this interface which marks that a call has been successfully established.
All Versions	In Call Failures	cwspInCallFailures	This object shows the total number of incoming Point-to-Point (p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC call attempts failed on this interface.
All Versions	In Filter Failures	cwspInFilterFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC call attempts which failed due to address filtering on this interface.

Table E-35 Call Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Route Failures	cwspInRouteFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MulitPoint(p2mp) SVC/SPVC call attempts on this interface which failed because there was no route to the destination available.
All Versions	In Resource Failures	cwspInResrcFailures	This object shows the number of incoming Point-to-Point(p2p) and Point-to-MulitPoint(p2mp) SVC/SPVC call attempts on this interface which failed because there were not enough resources as requested in the parameters of the call.
All Versions	In Timer Failures	cwspInTimerFailures	This object shows the number of signaling timers timed out for incoming Point-to-Point(p2p) and Point-to-MultiPoint(p2mp) SVC/SPVC calls on this interface.
All Versions	In Crankbacks	cwspInCrankbacks	This object shows the number of Crankback IEs received on this interface for incoming Point-to-Point(p2p) and Point-to-MultiPoint (p2mp) SVC/SPVC call attempts.
All Versions	Out Call Attempts	cwspOutCallAttempts	This object shows the number of outgoing Signaling messages (Setup and Add Party) on this interface for Call establishment.
All Versions	Out Call Estabs	cwspOutCallEstabs	This object shows the number of outgoing Signaling messages (Connect and Add Party Ack) which mark the call being established on this interface
All Versions	Out Call Failures	cwspOutCallFailures	This object shows the total number of outgoing Signaling messages for Point-to-Point and Point-to-MultiPoint call establishment on this interface which failed.
All Versions	Out Filter Failures	cwspOutFilterFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed the address filtering.

Table E-35 Call Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Out Route Failures	cwspOutRouteFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed because the route was not available.
All Versions	Out Resource Failures	cwspOutResrcFailures	This object shows the number of outgoing Signaling messages for call establishment on this interface which failed because the resource requested was not available.
All Versions	Out Timer Failures	cwspOutTimerFailures	This object shows the number of Signaling timers timed-out on this interface for outgoing signaling messages.
All Versions	Out Crankbacks	cwspOutCrankbacks	This object shows the number of Crankback IEs being sent on this interface for outgoing signaling Release messages. This is generated on the node which generates the Crankback IEs.

Table E-36 Load Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	BW Total	cwspLoadBwTotal	The total bandwidth of the interface.
All Versions	Max BW CBR	cwspLoadMaxBwCbr	The Maximum bandwith for CBR service.
All Versions	Max BW Real-Time VBR	cwspLoadMaxBwRtVbr	The maximum bandwith for real-time VBR service.
All Versions	Max BW Non Real-Time VBR	cwspLoadMaxBwNrtVbr	The maximum bandwith for non-real-time VBR service.
All Versions	Max BW ABR	cwspLoadMaxBwAbr	The maximum bandwith for ABR service.
All Versions	Max BW UBR	cwspLoadMaxBwUbr	The maximum bandwith for UBR service.
All Versions	BW Available	cwspLoadBwAvail	The total available bandwidth of the interface.
All Versions	Available BW CBR	cwspLoadAvlBwCbr	The available bandwith for CBR service.
All Versions	Avaliable BW Real-Time VBR	cwspLoadAvlBwRtVbr	The available bandwith for real-time VBR service.
All Versions	Available BW Non Real-Time VBR	cwspLoadAvlBwNrtVbr	The available bandwith for non-real-time VBR service.

Table E-36 Load Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Available BW ABR	cwspLoadAvlBwAbr	The available bandwith for ABR service.
All Versions	Available BW UBR	cwspLoadAvlBwUbr	The available bandwith for UBR service.
All Versions	Available VCs	cwspLoadVcAvail	The total number of available VCs of the interface.
All Versions	Avaailable VCs CBR	cwspLoadAvlVcCbr	The number of VCs used by CBR service.
All Versions	Available VCs Real-Time VBR	cwspLoadAvlVcRtVbr	The number of VCs used by real-time VBR service.
All Versions	cwspLoadAvlVcNrtVbr	cwspLoadAvlVcNrtVbr	The number of VCs used by non-real-time VBR service.
All Versions	cwspLoadAvlVcAbr	cwspLoadAvlVcAbr	The number of VCs used by ABR service.
All Versions	cwspLoadAvlVcUbr	cwspLoadAvlVcUbr	The number of VCs used by UBR service.
All Versions	cwspLoadCtdCbr	cwspLoadCtdCbr	The cell transfer delay of CBR service.
All Versions	cwspLoadCtdRtVbr	cwspLoadCtdRtVbr	The cell transfer delay of real-time VBR service.
All Versions	cwspLoadCtdNrtVbr	cwspLoadCtdNrtVbr	The cell transfer delay of non-real-time VBR service.
All Versions	cwspLoadCtdAbr	cwspLoadCtdAbr	The cell transfer delay of ABR service.
All Versions	cwspLoadCtdUbr	cwspLoadCtdUbr	The cell transfer delay of UBR service.
All Versions	cwspLoadCdvCbr	cwspLoadCdvCbr	The cell delay variation of CBR service.
All Versions	cwspLoadCdvRtVbr	cwspLoadCdvRtVbr	The cell delay variation of real-time VBR service.
All Versions	cwspLoadCdvNrtVbr	cwspLoadCdvNrtVbr	The cell delay variation of non-real-time VBR service.
All Versions	cwspLoadCdvAbr	cwspLoadCdvAbr	The cell delay variation of ABR service.
All Versions	cwspLoadCdvUbr	cwspLoadCdvUbr	The cell delay variation of UBR service.
All Versions	cwspLoadClr0Cbr	cwspLoadClr0Cbr	The cell loss ratio-0 of CBR service, -1 implies N/A.
All Versions	cwspLoadClr0RtVbr	cwspLoadClr0RtVbr	The cell loss ratio-0 of real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr0NrtVbr	cwspLoadClr0NrtVbr	The cell loss ratio-0 of non-real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr0Abr	cwspLoadClr0Abr	The cell loss ratio-0 of ABR service, -1 implies N/A.

Table E-36 Load Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspLoadClr0Ubr	cwspLoadClr0Ubr	The cell loss ratio-0 of UBR service, -1 implies N/A.
All Versions	cwspLoadClr01Cbr	cwspLoadClr01Cbr	The cell loss ratio-1 of CBR service, -1 implies N/A.
All Versions	cwspLoadClr01RtVbr	cwspLoadClr01RtVbr	The cell loss ratio-1 of real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr01NrtVbr	cwspLoadClr01NrtVbr	The cell loss ratio-1 of non-real-time VBR service, -1 implies N/A.
All Versions	cwspLoadClr01Abr	cwspLoadClr01Abr	The cell loss ratio-1 of ABR service, -1 implies N/A.
All Versions	cwspLoadClr01Ubr	cwspLoadClr01Ubr	The cell loss ratio-1 of UBR service, -1 implies N/A.
All Versions	cwspLoadMinGurCrCbr	cwspLoadMinGurCrCbr	The minimum guaranteed cell rate capacity of CBR service.
All Versions	cwspLoadMinGurCrRtVbr	cwspLoadMinGurCrRtVbr	The minimum guaranteed cell rate capacity of real-time VBR service.
All Versions	cwspLoadMinGurCrNrtVbr	cwspLoadMinGurCrNrtVbr	The minimum guaranteed cell rate capacity of non-real-time VBR service.
All Versions	cwspLoadMinGurCrAbr	cwspLoadMinGurCrAbr	The minimum guaranteed cell rate capacity of ABR service.
All Versions	cwspLoadMinGurCrUbr	cwspLoadMinGurCrUbr	The minimum guaranteed cell rate capacity of UBR service.

Table E-37 Signalling Statistics—evaluate_isPnPortPresent

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspCallProcRcv	cwspCallProcRcv	Number of CALL PROCEEDING messages received on this interface.
All Versions	cwspConnectRcv	cwspConnectRcv	Number of CONNECT messages received on this interface.
All Versions	cwspConnectAckRcv	cwspConnectAckRcv	Number of CONNECT ACK messages received on this interface.
All Versions	cwspSetupRcv	cwspSetupRcv	Number of SETUP messages received on this interface.
All Versions	cwspReleaseRcv	cwspReleaseRcv	Number of RELEASE messages received on this interface.
All Versions	cwspReleaseComplRcv	cwspReleaseComplRcv	Number of RELEASE COMPLETE messages received on this interface.
All Versions	cwspRestartRcv	cwspRestartRcv	Number of RESTART messages received on this interface.

Table E-37 Signalling Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspRestartAckRcv	cwspRestartAckRcv	Number of RESTART ACK messages received on this interface.
All Versions	cwspStatusRcv	cwspStatusRcv	Number of STATUS messages received on this interface.
All Versions	cwspStatusEnqRcv	cwspStatusEnqRcv	Number of STATUS ENQUIRY messages received on this interface.
All Versions	cwspNotifyRcv	cwspNotifyRcv	Number of NOTIFY messages received on this interface.
All Versions	cwspAlertRcv	cwspAlertRcv	Number of ALERT messages received on this interface.
All Versions	cwspProgressRcv	cwspProgressRcv	Number of PROGRESS messages received on this interface.
All Versions	cwspAddPtyRcv	cwspAddPtyRcv	Number of ADD PARTY messages received on this interface.
All Versions	cwspAddPtyAckRcv	cwspAddPtyAckRcv	Number of ADD PARTY ACK messages received on this interface.
All Versions	cwspAddPtyRejRcv	cwspAddPtyRejRcv	Number of ADD PARTY REJECT messages received on this interface.
All Versions	cwspDropPtyRcv	cwspDropPtyRcv	Number of DROP PARTY messages received on this interface.
All Versions	cwspIncorrectMsgRcv	cwspIncorrectMsgRcv	Number of Incorrect messages received on this interface.
All Versions	cwspTimerExpiries	cwspTimerExpiries	Number of timeouts occurred on this interface.
All Versions	cwspLastCause	cwspLastCause	to indicate the last cause of release or cranckback.
All Versions	cwspLastDiagnostic	cwspLastDiagnostic	to indicate the last diagnostic of release or cranckback.
All Versions	cwspCallProcXmt	cwspCallProcXmt	Number of CALL PROCEEDING messages transmitted from this interface.
All Versions	cwspConnectXmt	cwspConnectXmt	Number of CONNECT messages transmitted from this interface.
All Versions	cwspConnectAckXmt	cwspConnectAckXmt	Number of CONNECT ACK messages transmitted from this interface.
All Versions	cwspSetupXmt	cwspSetupXmt	Number of SETUP messages transmitted from this interface.
All Versions	cwspReleaseXmt	cwspReleaseXmt	Number of RELEASE messages transmitted from this interface.
All Versions	cwspReleaseComplXmt	cwspReleaseComplXmt	Number of RELEASE COMPLETE messages transmitted from this interface.

Table E-37 Signalling Statistics—evaluate_isPnPortPresent (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	cwspRestartXmt	cwspRestartXmt	Number of RESTART messages transmitted from this interface.
All Versions	cwspRestartAckXmt	cwspRestartAckXmt	Number of RESTART ACK messages transmitted from this interface.
All Versions	cwspStatusXmt	cwspStatusXmt	Number of STATUS messages transmitted from this interface.
All Versions	cwspStatusEnqXmt	cwspStatusEnqXmt	Number of STATUS ENQUIRY messages transmitted from this interface.
All Versions	cwspNotifyXmt	cwspNotifyXmt	Number of NOTIFY messages transmitted from this interface.
All Versions	cwspAlertXmt	cwspAlertXmt	Number of ALERT messages transmitted from this interface.
All Versions	cwspProgressXmt	cwspProgressXmt	Number of PROGRESS messages transmitted from this interface.
All Versions	cwspAddPtyXmt	cwspAddPtyXmt	Number of ADD PARTY messages transmitted from this interface.
All Versions	cwspAddPtyAckXmt	cwspAddPtyAckXmt	Number of ADD PARTY ACK messages transmitted from this interface.
All Versions	cwspAddPtyRejXmt	cwspAddPtyRejXmt	Number of ADD PARTY REJECT messages transmitted from this interface.
All Versions	cwspDropPtyXmt	cwspDropPtyXmt	Number of DROP PARTY messages transmitted from this interface.
All Versions	cwspSscopStatus	cwspSscopStatus	Sscop link status on an NNI interface, object is meaningful along with ciscoWANSscopLinkChange trap.

E.14 AXSME-SONET-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Section Current Counters
- Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

- Section Current 24 Hour Counters— cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Table E-38 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-39 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetLineCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	SESs	sonetLineCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	CVs	sonetLineCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	UASs	sonetLineCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndLineCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndLineCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndLineCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndLineCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-40 Section Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetSectionCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SESs	sonetSectionCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-40 Section Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	SEFSs	sonetSectionCurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	CVs	sonetSectionCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-41 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-42 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsLineCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsLineCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsLineCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsLineCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
All Versions	ESs (Far End)	cwsFELineCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
All Versions	SESs (Far End)	cwsFELineCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
All Versions	CVs (Far End)	cwsFELineCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
All Versions	UASs (Far End)	cwsFELineCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-43 Section Current 24 Hour Counters— cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsSectionCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsSectionCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	SEFs	cwsSectionCurrent24HrSEFSs	Number of SEFSs encountered in current 24 hour interval.
All Versions	CVs	cwsSectionCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-44 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-44 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-45 Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Section LOSs	cssLOSs	The number of Loss of signals(LOS) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Section LOFs	cssLOFs	The number of Loss of Frames (LOF) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Line AISs	cslAISs	The number of alarm indication signals(AIS) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
All Versions	Line RFIs	cslRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path AISs	cspAISs	The number of alarm indication signals (AIS) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path RFIs	cspRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.

E.15 MGX2-RPM-Card—Supported Real-Time Counters

No Real-Time Counters supported for MGX2-RPM-Card

E.16 RPM-EndPoint-Connection—Supported Real-Time Counters

No Real-Time Counters supported for the RPM-EndPoint-Connection

E.17 RPM-ETHERNET-Line—Supported Real-Time Counters

This section includes the following information:

- Category—Interface Counters
- Category—Ethernet Counters

Table E-46 Category—Interface Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Interface Speed	ifSpeed	Interface's Current Bandwidth in Bits/Sec
All Versions	Received Octets	ifInOctets	The total number of octets received on the interface, including framing characters.
All Versions	In Ucast Packets	ifInUcastPkts	The number of packets, delivered by this sub-layer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sub-layer. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	In Discarded Packets	ifInDiscards	The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	In Error Packets	ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol. For character- oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.

Table E-46 Category—Interface Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Discarded Packets (Unknown Protocol)	ifInUnknownProtos	For packet-oriented interfaces, the number of packets received via the interface which were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing the number of transmission units received via the interface which were discarded because of an unknown or unsupported protocol. For any interface that does not support protocol multiplexing, this counter will always be 0. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Tramsnitted Octets	ifOutOctets	The total number of octets transmitted out of the interface, including framing characters. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Ucast Packets	ifOutUcastPkts	The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sub-layer, including those that were discarded or not sent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Packets Discarded	ifOutDiscards	The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Error Packets	ifOutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Input BPS (5 min)	locIfInBitsSec	Five minute exponentially-decayed moving average of input bits per second.
All Versions	Output BPS (5 min)	locIfOutBitsSec	Five minute exponentially-decayed moving average of output bits per second.

Table E-46 Category—Interface Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Ignored In Packets	locIfInIgnored	Number of input packets which were simply ignored by this interface.
All Versions	Internal Resets	locIfResets	Number of times the interface internally reset.
All Versions	Output Collisions	locIfCollisions	The number of output collisions detected on this interface.
All Versions	Input Queue Drops	locIfInputQueueDrops	The number of packets dropped because the input queue was full.
All Versions	Output Queue Drops	locIfOutputQueueDrops	The number of packets dropped because the output queue was full.

Table E-47 Category—Ethernet Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Small Packets	locIfInRunts	Number of packets input which were smaller than the allowable physical media permitted.
All Versions	Large Packets	locIfInGiants	Number of input packets which were larger than the physical media permitted.
All Versions	Misaligned Packets	locIfInFrame	Number of input packet which were misaligned.
All Versions	dot3StatsIndex	dot3StatsIndex	An index value that uniquely identifies an interface to an ethernet-like medium. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex.
All Versions	Alignments	dot3StatsAlignmentErrors	A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check. The count represented by an instance of this object is incremented when the alignmentError status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtain are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
All Versions	SQE Test Errors	dot3StatsSQETestErrors	A count of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular interface. The SQE TEST ERROR message is defined in section 7.2.2.2.4 of ANSI/IEEE 802.3-1985 and its generation is described in section 7.2.4.6 of the same document.

Table E-47 Category—Ethernet Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Late Collisions	dot3StatsLateCollisions	The number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet. Five hundred and twelve bit-times corresponds to 51.2 microseconds on a 10 Mbit/s system. A (late) collision included in a count represented by an instance of this object is also considered as a (generic) collision for purposes of other collision-related statistics.
All Versions	MAC Tramsnit Errors	dot3StatsInternalMacTransmitErrors	A count of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsLateCollisions object, the dot3StatsExcessiveCollisions object, or the dot3StatsCarrierSenseErrors object. The precise meaning of the count represented by an instance of this object is implementation- specific. In particular, an instance of this object may represent a count of transmission errors on a particular interface that are not otherwise counted.
All Versions	Carrier Sense Errors	dot3StatsCarrierSenseErrors	The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface. The count represented by an instance of this object is incremented at most once per transmission attempt, even if the carrier sense condition fluctuates during a transmission attempt.
All Versions	Giant Frames	dot3StatsFrameTooLongs	A count of frames received on a particular interface that exceed the maximum permitted frame size. The count represented by an instance of this object is incremented when the frameTooLong status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtain are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
All Versions	MAC Receive Errors	dot3StatsInternalMacReceiveErrors	A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsFrameTooLongs object, the dot3StatsAlignmentErrors object, or the dot3StatsFCSErrors object. The precise meaning of the count represented by an instance of this object is implementation- specific. In particular, an instance of this object may represent a count of receive errors on a particular interface that are not otherwise counted.

E.18 RPM-Port—Supported Real-Time Counters

No Real-Time Counters supported for the RPM-Port

E.19 RPM-SONET-Line—Supported Real-Time Counters

This section includes the following information:

- Category—Interface Counters
- Category—Line Current Counters
- Category—Section Current Counters
- Category—Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Table E-48 Category—Interface Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Interface Speed	ifSpeed	Interface's Current Bandwidth in Bits/Sec
All Versions	Received Octets	ifInOctets	The total number of octets received on the interface, including framing characters.
All Versions	In Ucast Packets	ifInUcastPkts	The number of packets, delivered by this sub-layer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sub-layer. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	In Discarded Packets	ifInDiscards	The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	In Error Packets	ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol. For character- oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.

Table E-48 Category—Interface Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Discarded Packets (Unknown Protocol)	ifInUnknownProtos	For packet-oriented interfaces, the number of packets received via the interface which were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing the number of transmission units received via the interface which were discarded because of an unknown or unsupported protocol. For any interface that does not support protocol multiplexing, this counter will always be 0. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Tramsnitted Octets	ifOutOctets	The total number of octets transmitted out of the interface, including framing characters. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Ucast Packets	ifOutUcastPkts	The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sub-layer, including those that were discarded or not sent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Packets Discarded	ifOutDiscards	The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Out Error Packets	ifOutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime.
All Versions	Input BPS (5 min)	locIfInBitsSec	Five minute exponentially-decayed moving average of input bits per second.
All Versions	Output BPS (5 min)	locIfOutBitsSec	Five minute exponentially-decayed moving average of output bits per second.

Table E-48 Category—Interface Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Ignored In Packets	locIfInIgnored	Number of input packets which were simply ignored by this interface.
All Versions	Internal Resets	locIfResets	Number of times the interface internally reset.
All Versions	Output Collisions	locIfCollisions	The number of output collisions detected on this interface.
All Versions	Input Queue Drops	locIfInputQueueDrops	The number of packets dropped because the input queue was full.
All Versions	Output Queue Drops	locIfOutputQueueDrops	The number of packets dropped because the output queue was full.

Table E-49 Category—Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetLineCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	SESs	sonetLineCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	CVs	sonetLineCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	UASs	sonetLineCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndLineCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndLineCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-49 Category—Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndLineCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndLineCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-50 Category—Section Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetSectionCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SESs	sonetSectionCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SEFSs	sonetSectionCurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	CVs	sonetSectionCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-51 Category—Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.

Table E-51 Category—Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

E.20 RPM-VirtualPort—Supported Real-Time Counters

No Real-Time Counters supported for the RPM-VirtualPort

E.21 MGX2-SRM-Card—Supported Real-Time Counters

No Real-Time Counters supported for the MGX2-SRM-Card

E.22 MGX2-SRM-DS3-Line—Supported Real-Time Counters

This section includes the following information:

- Category—ATM Cell Layer Counters—cellLayer EQ true
- Category—Line Current Counters
- Category—Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12
- Category—Line Alarm Statistics
- PLCP Counters—cardFcType not equal to 160

Table E-52 Category—ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.

Table E-52 Category—ATM Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-53 Category—Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	PESs	dsx3CurrentPESs	The counter associated with the number of P-bit Errored Seconds.
cardFamily not equal to AXSMXG	PSESs	dsx3CurrentPSESs	The counter associated with the number of P-bit Severely Errored Seconds.
cardFamily not equal to AXSMXG	SEFSs	dsx3CurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds.
All Versions	UASs	dsx3CurrentUASs	The counter associated with the number of Unavailable Seconds.
cardFamily not equal to AXSMXG	LCVs	dsx3CurrentLCVs	The counter associated with the number of Line Coding Violations.
cardFamily not equal to AXSMXG	PCVs	dsx3CurrentPCVs	The counter associated with the number of P-bit Coding Violations.
cardFamily not equal to AXSMXG	LESs	dsx3CurrentLESs	The number of Line Errored Seconds.
All Versions	CCVs	dsx3CurrentCCVs	The number of C-bit Coding Violations.
All Versions	CESs	dsx3CurrentCESs	The number of C-bit Errored Seconds.
All Versions	CSESs	dsx3CurrentCSESs	The number of C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CESs (Far End)	dsx3FarEndCurrentCESs	The counter associated with the number of Far Far End C-bit Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CSESs (Far End)	dsx3FarEndCurrentCSESs	The counter associated with the number of Far End C-bit Severely Errored Seconds.

Table E-53 Category—Line Current Counters (continued)

cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CCVs (Far End)	dsx3FarEndCurrentCCVs	The counter associated with the number of Far End C-bit Coding Violations reported via the far end block error count.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	UASs (Far End)	dsx3FarEndCurrentUASs	The counter associated with the number of Far End unavailable seconds.

Table E-54 Category—Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12

Applicability	Counter Name	MIB Object Name	Description
All Versions	LCVs	cds3LCVCurrent24Hr	The number of LCVs encountered by the line since the start of current 24 hour period.
All Versions	LESs	cds3LESCurrent24Hr	The number LESs encountered by the line since the start of current 24 hour period.
All Versions	PCVs	cds3PCVCurrent24Hr	The number PCVs encountered by the line since the start of current 24 hour period.
All Versions	PESs	cds3PESCurrent24Hr	The number of PESs encountered by the line since the start of current 24 hour period.
All Versions	PSESs	cds3PSESCurrent24Hr	The number of PSESs encountered by the line since the start of current 24 hour period.
All Versions	SEFSs	cds3SEFSCurrent24Hr	The number of SEFSs encountered by the line since the start of the current 24 hour period.
All Versions	UASs	cds3UASCurrent24Hr	The number of UASs encountered by the line since the start of current 24 hour period.
All Versions	CCVs	cds3CCVCurrent24Hr	The number CCVs encounterd by the line since the start of current 24 hour period.
All Versions	CESs	cds3CESCurrent24Hr	The number of CESs encountered by the line since the start of current 24 hour period.
All Versions	CSESs	cds3CSESCurrent24Hr	The number of CSESs encountered by the line since th start of current 24 hour period.
All Versions	LSESs	cds3LSESCurrent24Hr	The number of LSESs (Line severedly errored seconds) encountered by the line since the start of current 24 hour period.

Table E-55 Category—Line Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	LOS Count	cds3RcvLOSCount	The number of times Loss of Signal was detected with or without integrating to LOS alarm.
cardFamily not equal to AXSMXG	OOF Count	cds3RcvOOFCount	The number of times Out of Frame was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds3RAICount	The number of timesRemote Alarm Indication was detected with or without integrating to RAI alarm.
All Versions	CCV Count	cds3CCVCount	The counter associated with the number of C-Bit Coding Violations encountered by a T3/E3 interface.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FE Count	cds3FECount	The number of Framing Errors encountered by a T3/E3 interface.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	EXZS Count	cds3EXZSCount	The number of Excessive Zeros(EXZ) by a T3/E3 interface. An EXZ is the occurrence of any string of zeros having length equal to or greater than 3 for B3ZS, or any string of zeros having length greater than 4 for HDB3.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	LCV Count	cds3LCVCount	The count of both BPVs(Bipolar Violations) and EXZs(Excessive Zeros) encountered by a T3/E3 interface.An EXZ increments the LCV by one regardless of the length of the zero string.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	PCV Count	cds3PCVCount	This is the count of P-bit Coding Violation(PCV) error event encountered by DS3 interface. For all DS3 applications, a coding violation error event is a P-bit Parity Error(PERR) event. The parity errors occur when the calculated parity in the information bits of the DS3 frame does not match up with an expected parity value.

Table E-55 Category—Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	CPE Count	cds3CPECount	The number of C-bit parity errors(CPERR) on a DS3 interface. This value is calculated over noninformation bits in the DS3 frame.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FEBE Count	cds3FEBECount	The number of Far End Block Errors(FEBE) encountered by a T3/E3 interface.These include frame alignment errors, multiframe alignment errors, and C-bit parity errors. These errors are generated by the transmitter at the far end, and indicate that the transmitter,cabling or the upstream node is faulty.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to SRM AND cardFamily not equal to MPSM	AIS Count	cds3RcvAISCount	The number of times Alarm Indication Signals(AIS) were detected. The AIS indicates that an upstream failure has been detected by the far end.

Table E-56 PLCP Counters—cardFcType not equal to 160

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentBIP-8CV	cds3PlcpBip8CVCurrent	The number of BIP-8 code violations (CV) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8CV	cds3PlcpBip8CV24HrBucket	The number of BIP-8 CVs encountered by the line in the last 24 hours.
All Versions	CurrentBIP-8ES	cds3PlcpBip8ESCurrent	The number of BIP-8 Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8ES	cds3PlcpBip8ES24HrBucket	The number of BIP-8 ES encountered by the line in the last 24 hour.
All Versions	CurrentBIP-8SES	cds3PlcpBip8SESCurrent	The number of BIP-8 Severely Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8SES	cds3PlcpBip8SES24HrBucket	The number of BIP-8 SES encountered by the line in the last 24 hour.

Table E-56 PLCP Counters—cardFcType not equal to 160 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentSEFs	cds3PlcpSEFSCurrent	The number of BIP-8 Severely Errored Framing Seconds(SEFS) encountered by the line in the current 15-minute period.
All Versions	Current24HrSEFs	cds3PlcpSEFS24HrBucket	The number of BIP-8 SEFS encountered by the line in the last 24 hour.
All Versions	CurrentUAS	cds3PlcpUASCurrent	The number of Unavailable Seconds(UAS) encountered by the line in the current 15-minute period.
All Versions	Current24HrUAS	cds3PlcpUAS24HrBucket	The number of BIP-8 UAS encountered by the line in the last 24 hour.
cardFamily EQ AXSME	BIP-8 Errors	cds3PlcpRcvBip8Count	The number of of BIP-8 errors encountered by the line.
All Versions	Num Of OOF	cds3PlcpRcvOOFCount	The number of times Out of Frame(OOF) was detected with or without integrating to OOF alarm.
cardFamily EQ AXSM AND cardFamily EQ AXSME	Num of RAI	cds3PlcpRcvRAICount	The number of times Remote Alarm Indication(RAI) was detected with or without integrating to RAI alarm.
cardFamily EQ AXSME	Num of FE Count	cds3PlcpFECount	The number of Framing Errors detected.
cardFamily EQ AXSME	Num of FESec	cds3PlcpFESecCount	The number of Framing Error errored seconds.
cardFamily EQ AXSME	Num of SEFESec	cds3PlcpSEFSecCount	The number of Severely errored Framing error seconds.
cardFamily EQ AXSME	Num of FEBE	cds3PlcpFEBECount	The count of Far End Block Errors (FEBE) detected.
cardFamily EQ AXSME	Num of FEBESec	cds3PlcpFEBESecCount	The number of FEBE errored seconds.
cardFamily EQ AXSME	Num of SEFEBESec	cds3PlcpSEFEBESecCount	The number of Severely errored FEBE seconds.

E.23 MGX2-SRM-SONET-Line—Supported Real-Time Counters

This section includes the following information:

- ATM Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Section Current Counters
- Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

- Section Current 24 Hour Counters— cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Alarm Statistics

Table E-57 ATM Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-58 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetLineCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	SESs	sonetLineCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	CVs	sonetLineCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	UASs	sonetLineCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndLineCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndLineCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndLineCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndLineCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-59 Section Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetSectionCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SESs	sonetSectionCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-59 Section Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	SEFSs	sonetSectionCurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	CVs	sonetSectionCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-60 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-61 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsLineCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsLineCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsLineCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsLineCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
All Versions	ESs (Far End)	cwsFELineCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
All Versions	SESs (Far End)	cwsFELineCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
All Versions	CVs (Far End)	cwsFELineCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
All Versions	UASs (Far End)	cwsFELineCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-62 Section Current 24 Hour Counters— cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsSectionCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsSectionCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	SEFs	cwsSectionCurrent24HrSEFSs	Number of SEFSs encountered in current 24 hour interval.
All Versions	CVs	cwsSectionCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-63 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-63 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-64 Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Section LOSs	cssLOSs	The number of Loss of signals(LOS) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Section LOFs	cssLOFs	The number of Loss of Frames (LOF) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Line AISs	cslAISs	The number of alarm indication signals(AIS) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
All Versions	Line RFIs	cslRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path AISs	cspAISs	The number of alarm indication signals (AIS) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path RFIs	cspRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.

E.24 Common/Card-BearerEndPoint—Supported Real-Time Counters

This section includes the following information:

- Bearer Counters—platform EQ NOTARES

Table E-65 Bearer Counters—platform EQ NOTARES

Applicability	Counter Name	MIB Object Name	Description
All Versions	Channel Id	bearerCid	This attribute defines the CID (Channel ID associated with this bearer connection.This refers to the same value as vismAal2CidNum in the vismAal2CidCnfTable.
All Versions	LCN	bearerLcn	This attribute defines the PVC or LCN number to which this bearer connection is associated with. This refers to the same value as in vismChanNum in vismChanCnfGrp table.
All Versions	Sent Packets	bearerSentPkts	This attribute defines the count of packets sent towards the network since setup.
All Versions	Received Packets	bearerRcvdPkts	This attribute defines the count of packets received from the network since setup.
All Versions	Sent Octets	bearerSentOctets	This attribute defines the count of bytes sent towards the network since this connection setup.
All Versions	Received Octets	bearerRcvdOctets	This attribute defines the count of bytes received from the network since this connection setup.
All Versions	Lost Packets	bearerLostPkts	This attribute defines the count of packets lost in the egress direction (from the network). This is a computed number based on the expected number of packets and the actual number of packets arrived from the network. Currently this object is not used.
All Versions	Jitter	bearerJitter	This attribute defines the jitter (a.k.a interarrival jitter) This value is determined by the DSP and obtained by the HOST processor upon querying the DSP on a periodic basis. This value is expressed in units of milliseconds. Currently this object is not used.
All Versions	Latency	bearerLatency	This attribute defines the latency (a.k.a end-to-end average transmission delay for a voice packet. This value is expressed in units of milliseconds. Currently this object is not used.

Table E-65 Bearer Counters—platform EQ NOTARES (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	AAL2 External AIS Count	bearerAal2ExtAISCnts	This object contains the number of external AIS aal2 Type3 packets received. External AIS - is a Alarm Indication Signal associated with a maintenance alarm detected on a defective maintenance span, that is transmitted in the direction of the defect as a substitute for normal signal. The purpose is to show the downstream entities that a defect has been identified and to prevent other maintenance alrams consequent to this first defect. External AIS bit stream is represented by an all 1's signal. Ref - ITU-T Rec. M.20 sec. 5.4.2 a
All Versions	AAL2 External RAI Count	bearerAal2ExtRAICnts	This object contains the number of external RAI aal2 Type3 packets received. External RAI - is a Remote Alarm Indication signal that is transmitted upstream from an entity that has detected defects persisting long enough to constitute a received signal failure. Its purpose is to report in the backward direction that there is an interruption of service in the forward direction. Ref - ITU-T Rec. G.704 section 2.1.3.1.3
All Versions	AAL2 Conn AIS Count	bearerAal2ConnAISCnts	This object contains the number of external Conn AIS aal2 Type2 packets received. External Conn AIS - is a Alarm Indicating Signal transmitted in the downstream direction from the AAL type 2 connecting point that first detects a defect affecting the AAL type 2 connection; this includes defects indicated by lower layers. Ref - ITU-T Rec. I.610 sec 6.2.2.1.1.1
All Versions	AAL2 Conn RDI Count	bearerAal2ConnRDICnts	This object contains the number of external Conn RDI (Remote Defect Ind.) aal2 Type2 packets received. External Conn RDI - is a signal transmitted upstream by an AAl type 2 endpoint that is in an alarm state as the result of having received an AAL type2 connection AIS or having detected a defect that affects the AAL type2 connection.

E.25 Common/Card-RudpSession—Supported Real-Time Counters

This section includes the following information:

- RUDP Session Counters

Table E-66 RUDP Session Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	vismRudpSessionAutoResets	vismRudpSessionAutoResets	Auto reset is also known as soft reset. VISM (gateway) initiates an auto reset when it detects that a connection has failed. This keeps track of the number of auto resets initiated by VISM.
All Versions	vismRudpSessionRcvdAutoResets	vismRudpSessionRcvdAutoResets	This is the counter for the number of auto resets initiated by MGC and received by VISM.
All Versions	vismRudpSessionRcvdInSeqs	vismRudpSessionRcvdInSeqs	This object indicates number of packets received in sequence.
All Versions	vismRudpSessionRcvdOutSeqs	vismRudpSessionRcvdOutSeqs	Number of packets received out of sequence.
All Versions	vismRudpSessionSentPackets	vismRudpSessionSentPackets	This is the number of packets sent by VISM. Including SYN message.
All Versions	vismRudpSessionRcvdPackets	vismRudpSessionRcvdPackets	This is the number of packets received by VISM. Including active message.
All Versions	vismRudpSessionSentBytes	vismRudpSessionSentBytes	This object indicates the number of bytes sent to MGC.
All Versions	vismRudpSessionRcvdBytes	vismRudpSessionRcvdBytes	This object keeps track of the number of bytes received from MGC.
All Versions	vismRudpSessionDataSentPkts	vismRudpSessionDataSentPkts	This object is the number of data packets sent to MGC.
All Versions	vismRudpSessionDataRcvdPkts	vismRudpSessionDataRcvdPkts	This object is the number of data packets received from MGC.
All Versions	vismRudpSessionDiscardPkts	vismRudpSessionDiscardPkts	This is the number of packets discarded.
All Versions	vismRudpSessionRetransPkts	vismRudpSessionRetransPkts	This is the number of packets retransmitted.

E.26 Common/Card-SrcpPeer—Supported Real-Time Counters

This section includes the following information:

- SRCP Peer Counters

Table E-67 SRCP Peer Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	SRCP Peer Name	srcpStatsPeerName	Denotes the name of the SRCP peer. If MGMIB is supported, this is the same as the mgcName from the mgcTable. It is provided here as a read-only parameter as a convinience feature.
All Versions	Discarded Count	packetsDiscardedCnts	The number of objects that were received and discarded. The packets may get discarded because of indecipherable PDUs like bad protocol version, bad command verb etc, or because of unknown transaction IDs (in case of SRCP clients).
All Versions	AUGW Count	augwCnts	The total number of AUGW commands received from the peer on this IP address.
All Versions	AULN Count	aulnCnts	The total number of AULN commands received from or sent to the peer on this IP address.
All Versions	RQNT Count	rqntCnts	The total number of RQNT commands received from or sent to the peer on this IP address.
All Versions	NTFY Count	ntfyCnts	The total number of NTFY commands received from or sent to the peer on this IP address.
All Versions	AUGW Fail Count	augwFailCnts	Media Gateway—The total number of AUGW commands received that were responded to with a failure return code. Media Gateway Controller—The total number of AUGW commands sent which were timed out without a response or for which a response with failure return code was received.
All Versions	AULN Fail Count	aulnFailCnts	Media Gateway—The total number of AULN commands received that were responded to with a failure return code. Media Gateway Controller—The total number of AULN commands sent which were timed out without a response or for which a response with failure return code was received.

Table E-67 SRCP Peer Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	RQNT Fail Count	rqntFailCnts	Media Gateway—The total number of RQNT commands received that were responded to with a failure return code. Media Gateway Controller—The total number of RQNT commands sent which were timed out without a response or for which a response with failure return code was received.
All Versions	NTFY Fail Count	ntfyFailCnts	Media Gateway—The total number of NTFY commands sent which were timed out without a response or for which a response with failure return code was received. Media Gateway Controller—The total number of NTFY commands received that were responded to with a failure return code.

E.27 Common/Card-XgcpPeer—Supported Real-Time Counters

This section includes the following information:

- XGCP Message Counters

Table E-68 XGCP Message Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	xgcpSuccessMessages	xgcpSuccessMessages	This object specifies the count of successful messages that communicate with the Media Gateway Controller on that IP address. Successful messages apply to both transmit and receive messages. Transmit: Positive ACK is received from the Media Gateway Controller Receive: Positive ACK is sent to the Media Gateway Controller. This implies that the format of the message is correct and the request can be fulfilled.
All Versions	xgcpFailMessages	xgcpFailMessages	This object specifies the count of failed messages that communicate with the Media Gateway Controller on that IP address. Failed messages apply to both transmit and receive messages. Transmit: Either NAK is received from the MGC or message times out waiting for ACK. Receive: Format of the received message is bad or the request can not be fulfilled.
All Versions	CRCX Count	vismXgcpCrcxCnts	This refers to the count of CRCX (Create Connection) messages received from the call agent since reset.
All Versions	CRCX Fail Count	vismXgcpCrcxFailCnts	This refers to the count of CRCX (Create Connection) messages received from the call agent that were responded to with a failure return code.

Table E-68 XGCP Message Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	MDCX Count	vismXgcpMdcxCnts	This refers to the count of MDCX (Modify Connection) messages received from the call agent since reset.
All Versions	MDCX Fail Count	vismXgcpMdcxFailCnts	This refers to the count of MDCX (Modify Connection) messages received from the call agent that were responded to with a failure return code.
All Versions	DLCX Received Count	vismXgcpDlcxRcvCnts	This refers to the count of DLCX (Delete Connection) messages received from the call agent since reset.
All Versions	DLCX Received Fail Count	vismXgcpDlcxRcvFailCnts	This refers to the count of DLCX (Delete Connection) messages received from the call agent that were responded to with a failure return code.
All Versions	DLCX Sent Count	vismXgcpDlcxSentCnts	This refers to the count of DLCX (Delete Connection) messages sent to the call agent since reset.
All Versions	DLCX Sent Fail Count	vismXgcpDlcxSentFailCnts	This refers to the count of DLCX (Delete Connection) messages sent to the call agent for which a response with failure return code was received or which timed out waiting for an acknowledgement.
All Versions	RQNT Count	vismXgcpRqntCnts	This refers to the count of RQNT (Request Notify) messages received from the call agent since reset.
All Versions	RQNT Fail Count	vismXgcpRqntFailCnts	This refers to the count of RQNT (Request Notify) messages received from the call agent that were responded to with a failure return code.
All Versions	Notify Count	vismXgcpNtfyCnts	This refers to the count of NTFY (Notify) messages sent to the call agent since reset.
All Versions	Notify Fail Count	vismXgcpNtfyFailCnts	This refers to the count of NTFY (Notify) messages sent to the call agent for which a response with failure return code was received or which timed out waiting for a response.
All Versions	Audit Endpoint Count	vismXgcpAuepCnts	This refers to the count of AUEP (Audit Endpoint) messages received from the call agent since reset.
All Versions	Audit Endpoint Fail Count	vismXgcpAuepFailCnts	This refers to the count of AUEP (Audit Endpoint) messages received from the call agent that were responded to with a failure return code.
All Versions	Audit Connection Count	vismXgcpAucxCnts	This refers to the count of AUCX (Audit Connection) messages received from the call agent since reset.
All Versions	Audit Connection Endpoint Count	vismXgcpAucxFailCnts	This refers to the count of AUCX (Audit Connection) messages received from the call agent that were responded to with a failure return code.

Table E-68 XGCP Message Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	RSIP Count	vismXgcpRsipCnts	This refers to the count of RSIP (Restart In Progress) messages sent to the call agent since reset.
All Versions	RSIP Fail Count	vismXgcpRsipFailCnts	This refers to the count of RSIP (Restart In Progress) messages sent to the call agent for which a response with failure return code was received or which timed out waiting for a response.

E.28 VISM-Card—Supported Real-Time Counters

This section includes the following information:

- Call Statistics
- Performance Statistics
- DS0 Information

Table E-69 Call Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Total Calls	vismTotalCalls	Total Calls
All Versions	Successful Calls	vismSuccessfulCalls	Successful Calls
All Versions	Failed Calls	vismFailedCalls	Failed Calls

Table E-70 Performance Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	CPU Utilization	vismCPUUtilization	CPU Utilization
All Versions	Memory Utilization	vismMemoryUtilization	Memory Utilization

Table E-71 DS0 Information

Applicability	Counter Name	MIB Object Name	Description
All Versions	Total DS0s Count	vismTotalDs0Count	Total DS0 Count
All Versions	Free DS0s Count	vismFreeDs0Count	Free DS0 Count
All Versions	Active DS0s Count	vismActiveDs0Count	Active DS0 Count
All Versions	Blocked DS0s Count	vismBlockDs0Count	Total DS0 Count
All Versions	Active High Water Mark DS0s Count	vismActiveHighjWaterMark	Total DS0 Count

E.29 VISM-DS1-Line—Supported Real-Time Counters

This section includes the following information:

- Line Counters
- DS0 Information—cardVersion Greater or Equal to 3.2

Table E-72 Line Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv LOS Count	rcvLOSCount	The number of times the Loss of Signal was detected with or without integrating to LOS alarm.
All Versions	Rcv OOF Count	rcvOOFCount	The number of times the Out of Frame was detected with or without integrating to OOF alarm.
All Versions	Rcv RAI Count	rcvRAICount	The number of times Yellow Alarms was detected with or without integrating to RAI alarm.
All Versions	Rcv FE Count	rcvFECount	The number of Framing Pattern Errors encountered by a DS1 interface.
All Versions	lCV Current	lCVCurrent	This counter counts the number of Line code violations encountered by the interface.
All Versions	lCV 15Min Bucket	lCV15MinBucket	The counter associated with the number of Line code violations in the last 15 minute period encountered by the interface.
All Versions	lCV 24Hr Bucket	lCV24HrBucket	The counter associated with the number of Line code violations in the last 24 hour period encountered by the interface.
All Versions	lES Current	lESCurrent	This counter counts the number of Line code violations Errored Seconds encountered by the interface.
All Versions	lES 15Min Bucket	lES15MinBucket	This counter counts the number of Line code violations Errored Seconds in the last 15 minutes encountered by the interface.
All Versions	lES 24Hr Bucket	lES24HrBucket	This counter counts the number of Line code violations Errored Seconds in the last 24 hours encountered by the interface.
All Versions	lSES Current	lSESCurrent	This counter counts the number of Line code violations Severely Errored Seconds encountered by the interface.
All Versions	lSES15MinBucket	lSES15MinBucket	This counter counts the number of LCV Severely Errored Seconds in the last 15 minutes encountered by the interface.
All Versions	lSES 24Hr Bucket	lSES24HrBucket	This counter counts the number of LCV Severely Errored Seconds in the last 24 hours encountered by the interface.
All Versions	CRC Current	cRCCurrent	This counter counts the number of P Bit code violations encountered by the interface.
All Versions	CRC 15Min Bucket	cRC15MinBucket	This counter counts the number of P Bit code violations in the last 15 minutes encountered by the interface.

Table E-72 Line Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CRC 24Hr Bucket	cRC24HrBucket	This counter counts the number of P Bit code violations in the last 24 hours encountered by the interface.
All Versions	CRC ES Current	cRCESCurrent	This counter counts the number of PCV Errored Seconds encountered by the interface.
All Versions	CRC ES 15Min Bucket	cRCES15MinBucket	This counter counts the number of PCV Errored Seconds in the last 15 minutes encountered by the interface.
All Versions	CRC ES 24HrBucket	cRCES24HrBucket	This counter counts the number of PCV Errored Seconds in the last 24 hours encountered by the interface.
All Versions	CRC SES Current	cRCSESCurrent	This counter counts the number of P Bit code violations Severely Errored Seconds encountered by the interface.
All Versions	CRC SES 15Min Bucket	cRCSES15MinBucket	This counter counts the number of PCV Severely Errored Seconds in the last 15 minutes encountered by the interface.
All Versions	CRC SES 24Hr Bucket	cRCSES24HrBucket	This counter counts the number of PCV Severely Errored Seconds in the last 24 hours encountered by the interface.
All Versions	SEFS Current	sEFSCurrent	This counter counts the number of Severely Errored Framing Seconds encountered by the interface.
All Versions	SEFS 15Min Bucket	sEFS15MinBucket	This counter counts the number of Severely Errored Framing Seconds in the last 15 minutes encountered by the interface.
All Versions	SEFS 24Hr Bucket	sEFS24HrBucket	This counter counts the number of Severely Errored Framing Seconds in the last 24 hours encountered by the interface.
All Versions	AISS Current	aISSCurrent	This counter counts the number of AIS Severely Errored Seconds encountered by the interface.
All Versions	AISS 15Min Bucket	aISS15MinBucket	This counter counts the number of AIS Severely Errored Seconds in the last 15 minutes encountered by the interface.
All Versions	AISS 24Hr Bucket	aISS24HrBucket	This counter counts the number of AIS Severely Errored Seconds in the last 24 hours encountered by the interface.
All Versions	UAS Current	uASCurrent	This counter counts the number of Unavailable Seconds encountered by the interface.
All Versions	UAS 15Min Bucket	uAS15MinBucket	This counter counts the number of Unavailable Seconds in the last 15 minutes encountered by the interface.
All Versions	UAS 24Hr Bucket	uAS24HrBucket	This counter counts the number of Unavailable Seconds in the last 24 hours encountered by the interface.
All Versions	Percent EFS	percentEFS	This counter counts the %LCV Error Free Seconds.

Table E-73 DS0 Information—cardVersion Greater or Equal to 3.2

Applicability	Counter Name	MIB Object Name	Description
All Versions	Configured DS0s Count	lineTotalDs0Count	This is the total number of ds0s configured on this DS1 line.
All Versions	Free DS0s Count	lineFreeDs0Count	This is the total number of free ds0s on this DS1 line.
All Versions	Active DS0s Count	lineActiveDs0Count	This is the number of active ds0s on this line.
All Versions	Blocked DS0s Count	lineBlockDs0Count	This is the number of blocked ds0s on this line.
All Versions	Active High Water Mark DS0s Count	lineActiveHighWaterMark	This is the high water mark number of ds0s that were active simultaneously on the line.

E.30 VISM-EndPoint-Connection—Supported Real-Time Counters

This section includes the following information:

- Channel Counters

Table E-74 Channel Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	AAL2 HEC Errors	vismChanAal2HecErrors	The count of egress AAL2 CPS(Common Part Sub-layer) PDUs dropped due to HEC (Header Error Control) error.
All Versions	AAL2 CRC Errors	vismChanAal2CrcErrors	The count of egress AAL2 type3 CPS PDUs dropped due to invalid CRC-10 error. CRC validation is for type 3 packets only. Type 1 packets are not subjected to CRC-10 error validation. Also this counter keeps track of CRC-10 errors for the type 3 packets which are generated by the the datamover CPU only. It does not take into account of type3 packets generated by the DSPs.
All Versions	OAM Lpb Lost Cells	vismChanAal2OamLpbLostCells	The count of OAM loopback cells lost. OAM loopback cells are sent on a periodic basis (1sec) on each PVC to monitor the health of the PVC. This is applicable for all PVCs.
All Versions	AAL2 Invalid OSF Cells	vismChanAal2InvOsfCells	The Number of AAL2 cells dropped due to invalid OSF (OffSet Field) in the egress direction.
All Versions	AAL2 Invalid Party Cells	vismChanAal2InvParCells	The Number of AAL2 cells dropped due to invalid Parity bit field in the egress direction.
All Versions	AAL2 CPS Packet Xmt	vismChanAal2CpsSentPkts	The count of AAL2 CPS packets sent to the network.
All Versions	AAL2 CPS Packet Rcv	vismChanAal2CpsRcvdPkts	The count of AAL2 CPS packets received from the network. This does not include the packets which are counted as error packets.

Table E-74 Channel Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	AAL2 Invalid CID CPS	vismChanAal2CpsInvCidPkts	The count of AAL2 CPS packets dropped in the egress direction due to invalid CID (Channel ID). The CID may be considered as invalid if - a) It is out of range. b) It is not configured
All Versions	AAL2 Invalid UUI CPS	vismChanAal2CpsInvUuiPkts	The count of AAL2 CPS packets dropped in the egress direction due to invalid UUI (User-to-User Info.) field.
All Versions	AAL2 Invalid Len CPS	vismChanAal2CpsInvLenPkts	The count of AAL2 CPS packets dropped in the egress direction due to invalid length field.
All Versions	AAL5 Invalid CPI	vismChanAal5InvCpiPdus	The count of AAL5 PDUs dropped in the egress direction due to invalid CPI (common part indicator) field in the AAL5 PDU trailer. This is applicable only to the PVCs configured as AAL5 PVCs (VoIP PVCs or CCS PVCs in the case of VoAAL2 application).
All Versions	AAL5 Oversized SDU PDU	vismChanAal5OversizedSdusRcvdPdus	The count of AAL5 PDUs dropped due to the SDU size bigger than the configured value. This is applicable for AAL5 PVCs only.
All Versions	AAL5 Invalid Len PDU	vismChanAal5InvLenPdus	The count of AAL5 PDUs dropped due to the length violations. This is applicable to the CCS PVCs. The HDLC frames should have a minimum frame size in order for the proper interpretation by the upper layer protocol.
All Versions	AAL5 PDU CRC32 Errors	vismChanAal5Crc32ErrorPdus	The count of AAL5 PDUs dropped in the egress direction due to CRC-32 errors detected by the SAR.
All Versions	AAL5 Reassembly Timer Expired PDU	vismChanAal5ReassemTimerExpiryPdus	The count of AAL5 PDU reassembly timer expirations. The timers are maintained in the egress direction for building an AAL5 PDU from the cells.
cardVersion greater or equal to 3.2.1	24 Hour Peak Xmt Cell Rate	vismChan24HrPeakXmtCellRate	This object counts the peak transmit cell rate (cells per second) for the channel since midnight with reference to node time; the peak cell rate counter gets reset to 0 every 24 hours at midnight. If the node time is changed, the counter will continue to gather data until the next time midnight is reached.
cardVersion greater or equal to 3.2.1	Current Xmt Cell rate	vismChanCurrentXmtCellRate	This object counts the current transmit cell rate (cells per second) for the channel.
cardVersion greater or equal to 3.2.1	24 Hour Peak Rcv Cell Rate	vismChan24HrPeakRcvCellRate	This object counts the peak receive cell rate (cells per second) for the channel since midnight with reference to node time; the peak cell rate counter gets reset to 0 every 24 hours at midnight. If the node time is changed, the counter will continue to gather data until the next time midnight is reached.

Table E-74 Channel Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardVersion greater or equal to 3.2.1	Current Rcv Cell Rate	vismChanCurrentRcvCellRate	This object counts the current receive cell rate (cells per second) for the channel.
cardVersion greater or equal to 3.2.1	AIS Suppress Count	vismChanAisSuppressCount	This object holds the number of times that ATM network alarms were successfully suppressed and prevented from propagating onto the TDM side for this PVC.

E.31 VISM-VirtualPort—Supported Real-Time Counters

No Real-Time Counters supported for the VISM-VirtualPort

E.32 Common/Card-MGMGLink—Supported Real-Time Counters

This section includes the following information:

- Gateway Counters
- Command Statistics
- Context Statistics

Table E-75 Gateway Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Messages Count	cmedNumInMessages	Total number of messages received on the link.
All Versions	Out Messages Count	cmedNumOutMessages	Total number of messages sent on the link.
All Versions	Signalling Level Errors Count	cmedNumErrors	Total number of signaling-level errors encountered. Includes, but is not limited to, number of bad messages received, number of failures to sent a message and number of other errors.
All Versions	Timer Recovery Events Count	cmedNumTimerRecovery	Total Number of timer recovery events since the statistics was last reset. This reflects all protocol timers that are supported (For H.248, T - start timer, S - short timer, L - long timer, and Z - long duration timer etc)
All Versions	Last Event Code	cmedxGatewayLastEvent	The event code of the last event occurred on the link.

Table E-76 Command Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Command ADD Fail Count	cmedxCmdNumAddFails	Total number of cumulative ADD commands failed in the media gateway link.
All Versions	Command ADD Succeed Count	cmedxCmdNumAddSucceeds	Total number of cumulative ADD command succeeded in the media gateway link.
All Versions	Command SUBTRACT Count	cmedxCmdNumSubtractFails	Total number of cumulative SUBTRACT commands failed in the media gateway link.
All Versions	Command SUBTRACT Succeed Count	cmedxCmdNumSubtractSucceeds	Total number of cumulative SUBTRACT commands succeeded in the media gateway link.
All Versions	Command MOVE Fail Count	cmedxCmdNumMoveFails	Total number of cumulative MOVE commands failed in the media gateway link.
All Versions	Command MOVE Succeed Count	cmedxCmdNumMoveSucceeds	Total number of cumulative MOVE commands succeeded in the media gateway link.
All Versions	Command MODIFY Count	cmedxCmdNumModifyFails	Total number of cumulative MODIFY commands failed in the media gateway link.
All Versions	Command MODIFY Succeed Count	cmedxCmdNumModifySucceeds	Total number of cumulative MODIFY commands succeeded in the media gateway link.
All Versions	Command AUDIT VALUE Count	cmedxCmdNumAuditValFails	Total number of cumulative AUDIT VALUE commands failed in the media gateway link.
All Versions	Command AUDIT VALUE Succeed Count	cmedxCmdNumAuditValSucceeds	Total number of cumulative AUDIT VALUE commands succeeded in the media gateway link.
All Versions	Command AUDIT CAPABILITY Count	cmedxCmdNumAuditCapFails	Total number of cumulative AUDIT CAPABILITY commands failed in the media gateway link.
All Versions	Command AUDIT CAPABILITY Succeed Count	cmedxCmdNumAuditCapSucceeds	Total number of cumulative AUDIT CAPABILITY commands succeeded in the media gateway link.
All Versions	Command NOTIFY Count	cmedxCmdNumNotifyFails	Total number of cumulative NOTIFY commands failed to respond from MGC.
All Versions	Command NOTIFY Succeed Count	cmedxCmdNumNotifySucceeds	Total number of cumulative NOTIFY commands successfully responded from the MGC.
All Versions	Command Service Change from MGC to MG Fail Count	cmedxCmdNumSrvChgFromMgcFails	Total number of cumulative ServiceChange commands from MGC to MG failed in the media gateway link.
All Versions	Command Service Change from MGC to MG Succeed Count	cmedxCmdNumSrvChgFromMgcSucceeds	Total number of cumulative ServiceChange commands from MGC to MG succeeded in the media gateway link.

Table E-76 Command Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Command Service Change from MG to MGC Fail Count	cmedxCmdNumSrvChgFromMgFails	Total number of cumulative ServiceChange commands from MG to MGC failed in MGC.
All Versions	Command Service Change from MG to MGC Succeed Count	cmedxCmdNumSrvChgFromMgSucceeds	Total number of cumulative ServiceChange commands from MG to MGC succeeded in MGC.

Table E-77 Context Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Active Contexts Count	cmedxCntxNumActiveContexts	The current number of active contexts in the media gateway link.
All Versions	Peak Active Contexts Count	cmedxCntxPeakNumActiveContexts	Peak number of active contexts in the media gateway link.
All Versions	Context Allocated Count	cmedxCntxNumContextAllocated	Total number of contexts has been allocated in the media gateway link.
All Versions	Context Freed Count	cmedxCntxNumContextFreed	Total number of contexts has been freed in the media gateway link.
All Versions	Shortext Context Life Span	cmedxCntxShortestContextLife	The shortest life span for the contexts in the media gateway link.
All Versions	Average Context Life Span	cmedxCntxAverageContextLife	The average life span for the contexts in the media gateway.
All Versions	Longest Context Life Span	cmedxCntxLongestContextLife	The longest life span for the contexts in the media gateway.
All Versions	Contexts with more than 2 Terminations	cmedxCntxNumCntxMoreThan2Terms	The number of contexts having more than 2 terminations in the media gateway link.

E.33 Common/Card-VxsmXgcp—Supported Real-Time Counters

This section includes the following information:

- XGCP Counters

Table E-78 XGCP Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Successful Messages	cXgcpMsgStatsSuccessMessages	This object indicates the count of successful messages that communicate with the Media Gateway Controller
All Versions	Fail Messages	cXgcpMsgStatsFailMessages	This object indicates the count of failed messages that communicate with the Media Gateway Controller
All Versions	Incomplete Messages	cXgcpMsgStatsIncompleteMessages	This object indicates the count of incomplete messages that communicate with the Media Gateway Controller

E.34 Common/Card-VxsmCid—Supported Real-Time Counters

This section includes the following information:

- CID Counters—platform EQ NOTARES

Table E-79 CID Counters—platform EQ NOTARES

Applicability	Counter Name	MIB Object Name	Description
All Versions	Sent Packets	catmtCidSentPackets	This object indicates the number of packets sent towards network side since the connection setup.
All Versions	Received Packets	catmtCidRcvdPackets	This object indicates the count of packets received from network side since the connection setup.
All Versions	Sent Octets	catmtCidSentOctets	This object indicates the count of bytes sent towards network side since connection setup.
All Versions	Received Octets	catmtCidRcvdOctets	This object indicates the count of bytes received from network since connection setup.
All Versions	Lost Packets	catmtCidLostPackets	This object indicates the count of packets lost in the egress direction (from the network). This number is computed based on the expected number of packets and the actual number of packets arrived from the network.
All Versions	Jitter	catmtCidJitter	This object indicates the jitter (a.k.a interarrival jitter). This value is determined by the gateway DSP and obtained by the processor running on gateway upon querying the DSP periodically.

Table E-79 CID Counters—platform EQ NOTARES (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	External AIS Count	catmtCidExtAISCnts	This object contains the number of external AIS AAL2 Type3 packets received. External AIS : alarm indication signal associated with a maintenance alarm detected on a defective maintenance span, that is transmitted in the direction of the defect as a substitute for normal signal. The purpose is to show the downstream entities that a defect has been identified and to prevent other maintenance alarms consequent to this first defect.
All Versions	External RAI Count	catmtCidExtRAICnts	This object contains the number of external RAI AAL2 Type3 packets received. External RAI is transmitted upstream from an entity that has detected defects persisting long enough to constitute a received signal failure. External RAI is to report in the backward direction to indicate there is an interruption of service in the forward direction.
All Versions	catmtCidConnAISCnts	catmtCidConnAISCnts	This object contains the number of external connection AIS AAL2 packets received. External Conn AIS is a Alarm Indicating Signal transmitted in the downstream direction from the AAL2 connecting point that first detects the defect affecting the AAL2 connection including defects indicated by the lower layers.
All Versions	External Connection RDI Count	catmtCidConnRDICnts	This object contains the number of external connection RDI AAL2 packets received. External Connection RDI - is a signal transmitted in the upstream direction by an AAL2 endpoint that is in alarm state, as the result of having received an AAL2 connection AIS or having detected a defect that affects the AAL2 connection.
All Versions	Nx64 Frames Xmt To TDM	catmtCidNx64FramesTxToTDM	This object contains the number of frames transmitted to the TDM interface. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	Nx64 Frames Rcv From TDM	catmtCidNx64FramesRxFromTDM	This object contains the number of frames received from the TDM interface. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	Nx64 Encoded Bytes Xmt To TDM	catmtCidNx64EncBytesTxToTDM	This object contains the number of encoded bytes transmitted to the TDM interface.
All Versions	Nx64 Encoded Bytes Rcv From TDM	catmtCidNx64EncBytesRxFromTDM	This object contains the number of encoded bytes received from the TDM interface.

Table E-79 CID Counters—platform EQ NOTARES (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	catmtCidNx64InvalidFCSFrames	catmtCidNx64InvalidFCSFrames	This object contains the number of invalid frames received with invalid Frame Check Sequence (FCS) error. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	catmtCidNx64AbortSeqFrames	catmtCidNx64AbortSeqFrames	This object contains the number of invalid frames received with invalid frame abort sequence error. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	catmtCidNx64InvalidShortFrames	catmtCidNx64InvalidShortFrames	This object contains the number of invalid short frames (length less than minimum length) received. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	catmtCidNx64InvalidLongFrames	catmtCidNx64InvalidLongFrames	This object contains the number of invalid long frames (length greater than maximum length) received. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	catmtCidNx64NoByteAlignErrorFrames	catmtCidNx64NoByteAlignErrorFrames	This object contains the number of invalid frames received with no byte alignment. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.
All Versions	catmtCidNx64RASTimeOutFrames	catmtCidNx64RASTimeOutFrames	This object contains the number of frames received with RAS timer timeout. This object is only applicable when catmtCidNx64Mode is set to to 'hdlc'.

E.35 Common/Card-RudpSession—Supported Real-Time Counters

This section includes the following information:

- RUDP Session Counters

Table E-80 RUDP Session Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Number Of Initiated Auto Resets	vismRudpSessionAutoResets	Auto reset is also known as soft reset. VISM (gateway) initiates an auto reset when it detects that a connection has failed. This keeps track of the number of auto resets initiated by VISM.
All Versions	Number Of Received Auto Resets	vismRudpSessionRcvdAutoResets	This is the counter for the number of auto resets initiated by MGC and received by VISM.
All Versions	Number Of Packets Received In Sequence	vismRudpSessionRcvdInSeqs	This object indicates number of packets received in sequence.

Table E-80 RUDP Session Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Number Of Packets Received Out Of Sequence	vismRudpSessionRcvdOutSeqs	Number of packets received out of sequence.
All Versions	Number Of Sent Packets	vismRudpSessionSentPackets	This is the number of packets sent by VISM. Including SYN message.
All Versions	Number Of Received Packets	vismRudpSessionRcvdPackets	This is the number of packets received by VISM. Including active message.
All Versions	Number Of Sent Bytes	vismRudpSessionSentBytes	This object indicates the number of bytes sent to MGC.
All Versions	Number Of Received Bytes	vismRudpSessionRcvdBytes	This object keeps track of the number of bytes received from MGC.
All Versions	Number Of Sent Data Packets	vismRudpSessionDataSentPkts	This object is the number of data packets sent to MGC.
All Versions	Number Of Received Data Packets	vismRudpSessionDataRcvdPkts	This object is the number of data packets received from MGC.
All Versions	Number Of Discarded Packets	vismRudpSessionDiscardPkts	This is the number of packets discarded.
All Versions	Number Of Retransmitted Packets	vismRudpSessionRetransPkts	This is the number of packets retransmitted.

E.36 Common/Card-MGMGLink—Supported Real-Time Counters

This section includes the following information:

- Gateway Counters
- Command Statistics
- Context Statistics

Table E-81 Gateway Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	In Messages Count	cmedNumInMessages	Total number of messages received on the link.
All Versions	Out Messages Count	cmedNumOutMessages	Total number of messages sent on the link.
All Versions	Signalling Level Errors Count	cmedNumErrors	Total number of signaling-level errors encountered. Includes, but is not limited to, number of bad messages received, number of failures to sent a message and number of other errors.

Table E-81 Gateway Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Timer Recovery Events Count	cmedNumTimerRecovery	Total Number of timer recovery events since the statistics was last reset. This reflects all protocol timers that are supported (For H.248, T - start timer, S - short timer, L - long timer, and Z - long duration timer etc)
All Versions	Last Event Code	cmedxGatewayLastEvent	The event code of the last event occurred on the link.

Table E-82 Command Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Commad ADD Fail Count	cmedxCmdNumAddFails	Total number of cumulative ADD commands failed in the media gateway link.
All Versions	Command ADD Succeed Count	cmedxCmdNumAddSucceeds	Total number of cumulative ADD command succeeded in the media gateway link.
All Versions	Command SUBTRACT Count	cmedxCmdNumSubtractFails	Total number of cumulative SUBTRACT commands failed in the media gateway link.
All Versions	Command SUBTRACT Succeed Count	cmedxCmdNumSubtractSucceeds	Total number of cumulative SUBTRACT commands succeeded in the media gateway link.
All Versions	Command MOVE Fail Count	cmedxCmdNumMoveFails	Total number of cumulative MOVE commands failed in the media gateway link.
All Versions	Command MOVE Succeed Count	cmedxCmdNumMoveSucceeds	Total number of cumulative MOVE commands succeeded in the media gateway link.
All Versions	Command MODIFY Count	cmedxCmdNumModifyFails	Total number of cumulative MODIFY commands failed in the media gateway link.
All Versions	Command MODIFY Succeed Count	cmedxCmdNumModifySucceeds	Total number of cumulative MODIFY commands succeeded in the media gateway link.
All Versions	Command AUDIT VALUE Count	cmedxCmdNumAuditValFails	Total number of cumulative AUDIT VALUE commands failed in the media gateway link.
All Versions	Command AUDIT VALUE Succeed Count	cmedxCmdNumAuditValSucceeds	Total number of cumulative AUDIT VALUE commands succeeded in the media gateway link.
All Versions	Command AUDIT CAPABILITY Count	cmedxCmdNumAuditCapFails	Total number of cumulative AUDIT CAPABILITY commands failed in the media gateway link.
All Versions	Command AUDIT CAPABILITY Succeed Count	cmedxCmdNumAuditCapSucceeds	Total number of cumulative AUDIT CAPABILITY commands succeeded in the media gateway link.
All Versions	Command NOTIFY Count	cmedxCmdNumNotifyFails	Total number of cumulative NOTIFY commands failed to respond from MGC.
All Versions	Command NOTIFY Succeed Count	cmedxCmdNumNotifySucceeds	Total number of cumulative NOTIFY commands successfully responded from the MGC.

Table E-82 Command Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Command Service Change from MGC to MG Fail Count	cmedxCmdNumSrvChgFromMgcFails	Total number of cumulative ServiceChange commands from MGC to MG failed in the media gateway link.
All Versions	Command Service Change from MGC to MG Succeed Count	cmedxCmdNumSrvChgFromMgcSucceeds	Total number of cumulative ServiceChange commands from MGC to MG succeeded in the media gateway link.
All Versions	Command Service Change from MG to MGC Fail Count	cmedxCmdNumSrvChgFromMgFails	Total number of cumulative ServiceChange commands from MG to MGC failed in MGC.
All Versions	Command Service Change from MG to MGC Succeed Count	cmedxCmdNumSrvChgFromMgSucceeds	Total number of cumulative ServiceChange commands from MG to MGC succeeded in MGC.

Table E-83 Context Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Active Contexts Count	cmedxCntxNumActiveContexts	The current number of active contexts in the media gateway link.
All Versions	Peak Active Contexts Count	cmedxCntxPeakNumActiveContexts	Peak number of active contexts in the media gateway link.
All Versions	Context Allocated Count	cmedxCntxNumContextAllocated	Total number of contexts has been allocated in the media gateway link.
All Versions	Context Freed Count	cmedxCntxNumContextFreed	Total number of contexts has been freed in the media gateway link.
All Versions	Shortext Context Life Span	cmedxCntxShortestContextLife	The shortest life span for the contexts in the media gateway link.
All Versions	Average Context Life Span	cmedxCntxAverageContextLife	The average life span for the contexts in the media gateway.
All Versions	Longest Context Life Span	cmedxCntxLongestContextLife	The longest life span for the contexts in the media gateway.
All Versions	Contexts with more than 2 Terminations	cmedxCntxNumCntxMoreThan2Terms	The number of contexts having more than 2 terminations in the media gateway link.

E.37 VXSM-VT-Path—Supported Real-Time Counters

No Real-Time Counters supported for VXSM-VT-Path

E.38 VXSM-VirtualPort—Supported Real-Time Counters

This section includes the following information:

- Port Counters

Table E-84 Port Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv CLP0 Cells (Egress)	cpAtmIfEgrRcvClp0Cells	The number of CLP-0 cells received from switch at the traffic management and policing device.
All Versions	Rcv CLP1 Cells (Egress)	cpAtmIfEgrRcvClp1Cells	The number of CLP-1 cells received from switch at the traffic management and policing device.
All Versions	Rcv CLP0 Discard Cells (Egress)	cpAtmIfEgrClp0DiscCells	The number of CLP-0 cells discarded due to policing.
All Versions	Rcv CLP1 Discard Cells (Egress)	cpAtmIfEgrClp1DiscCells	The number of CLP-1 cells discarded due to policing.
All Versions	Rcv OAM Cells (Egress)	cpAtmIfEgrRcvOAMCells	The number of OAM cells received from the switch at the traffic management and policing device.
All Versions	Rcv EFCI Cells (Egress)	cpAtmIfEgrRcvEFCICells	The number of EFCI cells received from the switch at traffic management and policing device.
All Versions	Xmt CLP0 Cells (Ingress)	cpAtmIfIngXmtClp0Cells	The number of CLP-0 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt CLP1 Cells (Ingress)	cpAtmIfIngXmtClp1Cells	The number of CLP-1 cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt EFCI Cells (Ingress)	cpAtmIfIngXmtEFCICells	The number of EFCI cells transmitted to the switch after traffic management and policing in ingress direction.
All Versions	Xmt OAM Cells (Ingress)	cpAtmIfIngXmtOAMCells	The number of OAM loopback cells transmitted to switch after traffic management and policing in ingress direction.

E.39 VXSM-TU-Path—Supported Real-Time Counters

No Real-Time Counters supported for VXSM-TU-Path

E.40 VXSM-TUG3-Path—Supported Real-Time Counters

No Real-Time Counters supported for VXSM-TUG3-Path

E.41 VXSM-STS-Path—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily EQ MPSM

Table E-85 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.

Table E-85 Atm Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-86 Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily NE VXSM AND cardFamily NE SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily NE VXSM AND cardFamily NE SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-87 Path Current 24 Hour Counters—cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

E.42 VXSM-STM-Path—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily EQ MPSM

Table E-88 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.

Table E-88 Atm Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-89 Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.

Table E-89 Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-90 Path Current 24 Hour Counters—cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

E.43 VXSM-SONET-Line—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Section Current Counters
- Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Section Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM
- Alarm Statistics

Table E-91 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.

Table E-91 Atm Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-92 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetLineCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	SESs	sonetLineCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	CVs	sonetLineCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.
All Versions	UASs	sonetLineCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndLineCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndLineCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-92 Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndLineCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndLineCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.

Table E-93 Section Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetSectionCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SESs	sonetSectionCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	SEFSs	sonetSectionCurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.
All Versions	CVs	sonetSectionCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.

Table E-94 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.

Table E-94 Path Current Counters—cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-95 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsLineCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsLineCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsLineCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsLineCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
All Versions	ESs (Far End)	cwsFELineCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
All Versions	SESs (Far End)	cwsFELineCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.

Table E-95 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CVs (Far End)	cwsFELineCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
All Versions	UASs (Far End)	cwsFELineCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-96 Section Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsSectionCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsSectionCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	SEFs	cwsSectionCurrent24HrSEFSs	Number of SEFSs encountered in current 24 hour interval.
All Versions	CVs	cwsSectionCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.

Table E-97 Path Current 24 Hour Counters—cardFamily not equal to AXSM AND cardFamily not equal to AXSMXG AND cardFamily not equal to VXSM AND cardFamily not equal to MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

Table E-98 Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
All Versions	Section LOSs	cssLOSs	The number of Loss of signals(LOS) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Section LOFs	cssLOFs	The number of Loss of Frames (LOF) encountered by a SONET/SDH Section. A high value for this object may indicate a problem with the Sonet Section layer.
All Versions	Line AISs	cslAISs	The number of alarm indication signals(AIS) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
All Versions	Line RFIs	cslRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Line. A high value for this object may indicate a problem with the Sonet Line layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path AISs	cspAISs	The number of alarm indication signals (AIS) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.
(cardFamily not equal to MPSM) OR (cardFamily EQ MPSM AND entityType EQ PATH)	Path RFIs	cspRFIs	The number of remote failure indications (RFI) encountered by a SONET/SDH Path. A high value for this object may indicate a problem with the Sonet Path layer.

E.44 VXSM-EndPoint-Connection—Supported Real-Time Counters

This section includes the following information:

- Channel Counters

Table E-99 Channel Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	Xmt CLP0 (Ingress)	cwacsIngXmtCLP0	The number of valid CLP=0 ATM cells in the ingress direction of this Channel after the traffic management entity.
All Versions	Xmt CLP1 (Ingress)	cwacsIngXmtCLP1	The number of valid CLP=1 ATM cells in the ingress direction of this Channel after the traffic management entity.
All Versions	Xmt CLP0 (Egress)	cwacsEgrXmtCLP0	The number of valid CLP=0 ATM cells in the egress direction of this Channel AFTER the traffic management entity.
All Versions	Xml CLP1 (Egress)	cwacsEgrXmtCLP1	The number of valid CLP=1 ATM cells in the egress direction of this Channel AFTER the traffic management entity.
All Versions	CLP0 COS Discard (Egress)	cwacsEgrCLP0CoSDiscard	The number of valid CLP=0 cells in the egress direction of this Channel that are discarded at the CoS queue due to overflow.
All Versions	CLP1 COS Discard (Egress)	cwacsEgrCLP1CoSDiscard	The number of valid CLP=1 cells in the egress direction of this Channel that are discarded at the CoS queue due to overflow.
All Versions	Rcv EFCI0 (Egress)	cwacsEgrRcvEFCI0	The number of valid EFCI=0 cells in the egress direction of this Channel before CoS queue.
All Versions	Rcv EFCI1 (Egress)	cwacsEgrRcvEFCI1	The number of valid EFCI=1 cells in the egress direction of this Channel before the class of service queue.
All Versions	EFCI0 Discard (Egress)	cwacsEgrEFCI0Discard	The number of valid EFCI=0 cells in the egress direction of this Channel that are discarded at the CoS queue.
All Versions	EFCI1 Discard (Egress)	cwacsEgrEFCI1Discard	The number of valid EFCI=1 cells in the egress direction of this Channel that are discarded at the CoS queue.
All Versions	Rcv OAM (Egress)	cwacsEgrRcvOAM	The number of valid OAM cells in the egress direction of this Channel before the CoS queue.
All Versions	OAM Discard (Egress)	cwacsEgrOAMDiscard	The number of valid OAM cells in the egress direction of this Channel that are discarded at the CoS queue.
All Versions	Rcv RM (Egress)	cwacsEgrRcvRM	The number of valid RM cells in the egress direction of this Channel before the CoS queue.
All Versions	RM Discard (Egress)	cwacsEgrRMDiscard	The number of valid RM cells in the egress direction of this Channel that are discarded at the CoS queue due to overflow.

E.45 VXSM-DS3-Path—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12
- Line Alarm Statistics
- Plcp Counters—cardFcType not equal to 160

Table E-100 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.

Table E-100 Atm Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-101 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	PESs	dsx3CurrentPESs	The counter associated with the number of P-bit Errored Seconds.
cardFamily not equal to AXSMXG	PSESs	dsx3CurrentPSESs	The counter associated with the number of P-bit Severely Errored Seconds.
cardFamily not equal to AXSMXG	SEFSs	dsx3CurrentSEFSs	The counter associated with the number of Severely Errored Framing Seconds.
All Versions	UASs	dsx3CurrentUASs	The counter associated with the number of Unavailable Seconds.
cardFamily not equal to AXSMXG	LCVs	dsx3CurrentLCVs	The counter associated with the number of Line Coding Violations.
cardFamily not equal to AXSMXG	PCVs	dsx3CurrentPCVs	The counter associated with the number of P-bit Coding Violations.
cardFamily not equal to AXSMXG	LESs	dsx3CurrentLESs	The number of Line Errored Seconds.
All Versions	CCVs	dsx3CurrentCCVs	The number of C-bit Coding Violations.
All Versions	CESs	dsx3CurrentCESs	The number of C-bit Errored Seconds.
All Versions	CSESs	dsx3CurrentCSESs	The number of C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CESs (Far End)	dsx3FarEndCurrentCESs	The counter associated with the number of Far Far End C-bit Errored Seconds.

Table E-101 Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CSESs (Far End)	dsx3FarEndCurrentCSESs	The counter associated with the number of Far End C-bit Severely Errored Seconds.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	CCVs (Far End)	dsx3FarEndCurrentCCVs	The counter associated with the number of Far End C-bit Coding Violations reported via the far end block error count.
cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12	UASs (Far End)	dsx3FarEndCurrentUASs	The counter associated with the number of Far End unavailable seconds.

Table E-102 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12

Applicability	Counter Name	MIB Object Name	Description
All Versions	LCVs	cds3LCVCurrent24Hr	The number of LCVs encountered by the line since the start of current 24 hour period.
All Versions	LESs	cds3LESCurrent24Hr	The number LESs encountered by the line since the start of current 24 hour period.
All Versions	PCVs	cds3PCVCurrent24Hr	The number PCVs encountered by the line since the start of current 24 hour period.
All Versions	PESs	cds3PESCurrent24Hr	The number of PESs encountered by the line since the start of current 24 hour period.
All Versions	PSESs	cds3PSESCurrent24Hr	The number of PSESs encountered by the line since the start of current 24 hour period.
All Versions	SEFSs	cds3SEFSCurrent24Hr	The number of SEFSs encountered by the line since the start of the current 24 hour period.
All Versions	UASs	cds3UASCurrent24Hr	The number of UASs encountered by the line since the start of current 24 hour period.
All Versions	CCVs	cds3CCVCurrent24Hr	The number CCVs encounterd by the line since the start of current 24 hour period.

Table E-102 Line Current 24 Hour Counters—cardFamily EQ AXSME OR cardFamily EQ PXM1E OR cardFamily EQ MPSM OR cardFamily EQ FRSM12 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	CESs	cds3CESCurrent24Hr	The number of CESs encountered by the line since the start of current 24 hour period.
All Versions	CSESs	cds3CSESCurrent24Hr	The number of CSESs encountered by the line since th start of current 24 hour period.
All Versions	LSESs	cds3LSESCurrent24Hr	The number of LSESs (Line severedly errored seconds) encountered by the line since the start of current 24 hour period.

Table E-103 Line Alarm Statistics

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSMXG	LOS Count	cds3RcvLOSCount	The number of times Loss of Signal was detected with or without integrating to LOS alarm.
cardFamily not equal to AXSMXG	OOF Count	cds3RcvOOFCount	The number of times Out of Frame was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds3RAICount	The number of timesRemote Alarm Indication was detected with or without integrating to RAI alarm.
All Versions	CCV Count	cds3CCVCount	The counter associated with the number of C-Bit Coding Violations encountered by a T3/E3 interface.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FE Count	cds3FECount	The number of Framing Errors encountered by a T3/E3 interface.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	EXZS Count	cds3EXZSCount	The number of Excessive Zeros(EXZ) by a T3/E3 interface. An EXZ is the occurrence of any string of zeros having length equal to or greater than 3 for B3ZS, or any string of zeros having length greater than 4 for HDB3.

Table E-103 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	LCV Count	cds3LCVCount	The count of both BPVs(Bipolar Violations) and EXZs(Excessive Zeros) encountered by a T3/E3 interface.An EXZ increments the LCV by one regardless of the length of the zero string.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	PCV Count	cds3PCVCount	This is the count of P-bit Coding Violation(PCV) error event encountered by DS3 interface. For all DS3 applications, a coding violation error event is a P-bit Parity Error(PERR) event. The parity errors occur when the calculated parity in the information bits of the DS3 frame does not match up with an expected parity value.
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	CPE Count	cds3CPECount	The number of C-bit parity errors(CPERR) on a DS3 interface. This value is calculated over noninformation bits in the DS3 frame.

Table E-103 Line Alarm Statistics (continued)

Applicability	Counter Name	MIB Object Name	Description
cardFamily not equal to AXSM AND cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to MPSM	FEBE Count	cds3FEBECount	The number of Far End Block Errors(FEBE) encountered by a T3/E3 interface.These include frame alignment errors, multiframe alignment errors, and C-bit parity errors. These errors are generated by the transmitter at the far end, and indicate that the transmitter,cabling or the upstream node is faulty.
cardFamily not equal to AXSME AND cardFamily not equal to AXSMXG AND cardFamily not equal to PXM1E AND cardFamily not equal to SRM AND cardFamily not equal to MPSM	AIS Count	cds3RcvAISCount	The number of times Alarm Indication Signals(AIS) were detected. The AIS indicates that an upstream failure has been detected by the far end.

Table E-104 Plcp Counters—cardFcType not equal to 160

Applicability	Counter Name	MIB Object Name	Description
All Versions	CurrentBIP-8CV	cds3PlcpBip8CVCurrent	The number of BIP-8 code violations (CV) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8CV	cds3PlcpBip8CV24HrBucket	The number of BIP-8 CVs encountered by the line in the last 24 hours.
All Versions	CurrentBIP-8ES	cds3PlcpBip8ESCurrent	The number of BIP-8 Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8ES	cds3PlcpBip8ES24HrBucket	The number of BIP-8 ES encountered by the line in the last 24 hour.
All Versions	CurrentBIP-8SES	cds3PlcpBip8SESCurrent	The number of BIP-8 Severely Errored Seconds(ES) encountered by the line in the current 15 minute period.
All Versions	Current24HrBIP-8SES	cds3PlcpBip8SES24HrBucket	The number of BIP-8 SES encountered by the line in the last 24 hour.
All Versions	CurrentSEFs	cds3PlcpSEFSCurrent	The number of BIP-8 Severely Errored Framing Seconds(SEFS) encountered by the line in the current 15-minute period.

Table E-104 Plcp Counters—cardFcType not equal to 160 (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Current24HrSEFs	cds3PlcpSEFS24HrBucket	The number of BIP-8 SEFS encountered by the line in the last 24 hour.
All Versions	CurrentUAS	cds3PlcpUASCurrent	The number of Unavailable Seconds(UAS) encountered by the line in the current 15-minute period.
All Versions	Current24HrUAS	cds3PlcpUAS24HrBucket	The number of BIP-8 UAS encountered by the line in the last 24 hour.
cardFamily EQ AXSME	BIP-8 Errors	cds3PlcpRcvBip8Count	The number of of BIP-8 errors encountered by the line.
All Versions	Num Of OOF	cds3PlcpRcvOOFCount	The number of times Out of Frame(OOF) was detected with or without integrating to OOF alarm.
cardFamily EQ AXSM AND cardFamily EQ AXSME	Num of RAI	cds3PlcpRcvRAICount	The number of times Remote Alarm Indication(RAI) was detected with or without integrating to RAI alarm.
cardFamily EQ AXSME	Num of FE Count	cds3PlcpFECount	The number of Framing Errors detected.
cardFamily EQ AXSME	Num of FESec	cds3PlcpFESecCount	The number of Framing Error errored seconds.
cardFamily EQ AXSME	Num of SEFESec	cds3PlcpSEFSecCount	The number of Severely errored Framing error seconds.
cardFamily EQ AXSME	Num of FEBE	cds3PlcpFEBECount	The count of Far End Block Errors (FEBE) detected.
cardFamily EQ AXSME	Num of FEBESec	cds3PlcpFEBESecCount	The number of FEBE errored seconds.
cardFamily EQ AXSME	Num of SEFEBESec	cds3PlcpSEFEBESecCount	The number of Severely errored FEBE seconds.

E.46 VXSM-DS1-Path—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Alarm Statistics—cardFamily EQ VXSM

Table E-105 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-106 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	dsx1CurrentESs	The number of Errored Seconds.
All Versions	SESs	dsx1CurrentSESs	The number of Severely Errored Seconds.

Table E-106 Line Current Counters (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	SEFSs	dsx1CurrentSEFSs	The number of Severely Errored Framing Seconds.
All Versions	UASs	dsx1CurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs	dsx1CurrentCSSs	The number of Controlled Slip Seconds.
All Versions	PCVs	dsx1CurrentPCVs	The number of Path Coding Violations.
All Versions	LESs	dsx1CurrentLESs	The number of Line Errored Seconds.
cardFcType EQ 602	BESs	dsx1CurrentBESs	The number of Bursty Errored Seconds.
All Versions	LCVs	dsx1CurrentLCVs	The number of Line Code Violations (LCVs).
All Versions	ESs (Far End)	dsx1FarEndCurrentESs	The number of Far End Errored Seconds.
All Versions	SESs (Far End)	dsx1FarEndCurrentSESs	The number of Far End Severely Errored Seconds.
All Versions	SEFSs (Far End)	dsx1FarEndCurrentSEFSs	The number of Far End Severely Errored Framing Seconds.
All Versions	UASs (Far End)	dsx1FarEndCurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs (Far End)	dsx1FarEndCurrentCSSs	The number of Far End Controlled Slip Seconds.
All Versions	LESs (Far End)	dsx1FarEndCurrentLESs	The number of Far End Line Errored Seconds.
All Versions	PCVs (Far End)	dsx1FarEndCurrentPCVs	The number of Far End Path Coding Violations.
cardFcType EQ 602	BESs (Far End)	dsx1FarEndCurrentBESs	The number of Far End Bursty Errored Seconds.

Table E-107 Line Alarm Statistics—cardFamily EQ VXSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	LOS Count	cds1LOSCounts	The number of times the Loss Of Signal defect was detected with or without integrating to LOS alarm.
All Versions	OOF Count	cds1OOFCounts	The number of times the Out of Frame (OOF) was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds1RAICounts	The number of times Yellow Alarms was detected with or without integrating to RAI alarm.
All Versions	FE Count	cds1FECounts	The number of Framing Pattern Errors encountered by the DS1 interface.

E.47 VXSM-DS1-Line—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Line Current Counters
- Line Alarm Statistics—cardFamily EQ VXSM

Table E-108 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-109 Line Current Counters

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	dsx1CurrentESs	The number of Errored Seconds.
All Versions	SESs	dsx1CurrentSESs	The number of Severely Errored Seconds.
All Versions	SEFSs	dsx1CurrentSEFSs	The number of Severely Errored Framing Seconds.
All Versions	UASs	dsx1CurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs	dsx1CurrentCSSs	The number of Controlled Slip Seconds.
All Versions	PCVs	dsx1CurrentPCVs	The number of Path Coding Violations.
All Versions	LESs	dsx1CurrentLESs	The number of Line Errored Seconds.
cardFcType EQ 602	BESs	dsx1CurrentBESs	The number of Bursty Errored Seconds.
All Versions	LCVs	dsx1CurrentLCVs	The number of Line Code Violations (LCVs).
All Versions	ESs (Far End)	dsx1FarEndCurrentESs	The number of Far End Errored Seconds.
All Versions	SESs (Far End)	dsx1FarEndCurrentSESs	The number of Far End Severely Errored Seconds.
All Versions	SEFSs (Far End)	dsx1FarEndCurrentSEFSs	The number of Far End Severely Errored Framing Seconds.
All Versions	UASs (Far End)	dsx1FarEndCurrentUASs	The number of Unavailable Seconds.
cardFcType EQ 602	CSSs (Far End)	dsx1FarEndCurrentCSSs	The number of Far End Controlled Slip Seconds.
All Versions	LESs (Far End)	dsx1FarEndCurrentLESs	The number of Far End Line Errored Seconds.
All Versions	PCVs (Far End)	dsx1FarEndCurrentPCVs	The number of Far End Path Coding Violations.
cardFcType EQ 602	BESs (Far End)	dsx1FarEndCurrentBESs	The number of Far End Bursty Errored Seconds.

Table E-110 Line Alarm Statistics—cardFamily EQ VXSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	LOS Count	cds1LOSCounts	The number of times the Loss Of Signal defect was detected with or without integrating to LOS alarm.
All Versions	OOF Count	cds1OOFCounts	The number of times the Out of Frame (OOF) was detected with or without integrating to OOF alarm.
All Versions	RAI Count	cds1RAICounts	The number of times Yellow Alarms was detected with or without integrating to RAI alarm.
All Versions	FE Count	cds1FECounts	The number of Framing Pattern Errors encountered by the DS1 interface.

E.48 VXSM-AU-Path—Supported Real-Time Counters

This section includes the following information:

- Atm Cell Layer Counters—cellLayer EQ true
- Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM
- Path Current 24 Hour Counters—cardFamily EQ MPSM

Table E-111 Atm Cell Layer Counters—cellLayer EQ true

Applicability	Counter Name	MIB Object Name	Description
All Versions	CLP0 Cells (Ingress)	caclInRcvCLP0Cells	The number of cells received on the interface with CLP0 bit set.
All Versions	CLP1 Cells (Ingress)	caclInRcvCLP1Cells	The number of cells received on the interface with CLP1 bit set.
All Versions	Valid OAM Cells (Ingress)	caclInValidOAMCells	The number of valid Operation and Maintainance(OAM) cells received on the interface.
All Versions	Valid OAM Cells (Egress)	caclOutValidOAMCells	The number of Operartion and Maintainance(OAM) cells received by the interface from the switch fabric.
All Versions	Err OAM Cells (Ingress)	caclInErrOAMCells	The number of errored OAM cells received on the interface.
All Versions	Err OAM Cells (Egress)	caclOutErrOAMCells	The number of errored OAM cells received by the interface from the switch fabric.
All Versions	Corrected HecErr Cells (Ingress)	caclInHecErrCorrectedCells	The number of received cells which had HEC errors that were corrected.
All Versions	Non Zero GFC Cells (Ingress)	caclInGfcCells	The number of non-zero GFC cells received on the interface.
All Versions	Invalid VPI/VCI/PTI Cells (Ingress)	caclInVpiVciErrCells	The number of cells received from the interface with unknown Vpi/Vci values.
All Versions	Last Unknown VPI (Ingress)	caclInLastUnknVpi	The last unknown Vpi value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Lask Unknown VCI (Ingress)	caclInLastUnknVci	The last unknown Vci value. This object is valid only if 'caclInVpiVciErrCells' is non-zero.
All Versions	Rcv Valid RM Cells (Ingress)	caclInValidRMCells	The number of Valid RM cells received from the interface.
All Versions	Rcv Valid RM Cells (Egress)	caclOutRcvValidRMCells	The number of Valid RM cells received by the interface from the switch fabric.

Table E-111 Atm Cell Layer Counters—cellLayer EQ true (continued)

Applicability	Counter Name	MIB Object Name	Description
All Versions	Rcv Idle Cells (Ingress)	caclInRcvIdleCells	The number of idle cells received from the interface.
All Versions	Discard HecErr Cells (Ingress)	caclInHecErrDiscCells	Header Error Check (HEC) calculation is used to provide error detection and correction from the ATM cell header. This object is the number of received cells which were discarded because they had HEC errors.

Table E-112 Path Current Counters—cardFamily EQ AXSMXG OR cardFamily EQ VXSM OR cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	sonetPathCurrentESs	The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	SESs	sonetPathCurrentSESs	The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	CVs	sonetPathCurrentCVs	The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute interval.
All Versions	UASs	sonetPathCurrentUASs	The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	ESs (Far End)	sonetFarEndPathCurrentESs	The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	SESs (Far End)	sonetFarEndPathCurrentSESs	The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	CVs (Far End)	sonetFarEndPathCurrentCVs	The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval.
cardFamily not equal to VXSM AND cardFamily not equal to SRM	UASs (Far End)	sonetFarEndPathCurrentUASs	The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.

Table E-113 Path Current 24 Hour Counters—cardFamily EQ MPSM

Applicability	Counter Name	MIB Object Name	Description
All Versions	ESs	cwsPathCurrent24HrESs	Number of errored seconds encountered in current 24 hour interval.
All Versions	SESs	cwsPathCurrent24HrSESs	Number of SESs encountered in current 24 hour interval.
All Versions	CVs	cwsPathCurrent24HrCVs	Number of CVs encountered in current 24 hour interval.
All Versions	UASs	cwsPathCurrent24HrUASs	Number of UASs encountered in current 24 hour interval.
cardFamily not equal to VXSM	ESs (Far End)	cwsFEPathCurrent24HrESs	Number of far end errored seconds encountered in current 24 hour interval.
cardFamily not equal to VXSM	SESs (Far End)	cwsFEPathCurrent24HrSESs	Number of far end SESs encountered in current 24 hour interval.
cardFamily not equal to VXSM	CVs (Far End)	cwsFEPathCurrent24HrCVs	Number of far end CVs encountered in current 24 hour interval.
cardFamily not equal to VXSM	UASs (Far End)	cwsFEPathCurrent24HrUASs	Number of far end UASs encountered in current 24 hour interval.

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Numbers

3R retime, reshape, and regenerate

A

AC alternating current

ACO alarm cutoff

ADA Add/Drop Amplifier module

AIC Alarm Interface Controller card

AID access identifier

AIP Alarm Interface Panel

AIS alarm indication signal

AIS-L line alarm indication signal

AIS-P path alarm indication signal

AIU Alarm Interface Unit module

AMI alternate mark inversion

ANS automatic node setup

ANSI American National Standards Institute

API Application Programming Interface

APS automatic protection switching

ARP Address Resolution Protocol

ASCII American Standard Code for Information Interchange

ASIC application-specific integrated circuit

ATM asynchronous transfer mode

AWG arrayed waveguide grating

AXSM ATM switch service module for the MGX 8850 (double height card)

AXSM-E Enhanced AXSM (double height card)

B

B8ZS binary 8-zero substitution

BAT Battery Management module

BBA Blue-band Booster Amplifier module

BBE background block errors

BCS-ELH Band Combiner and Splitter–Extended Long Haul module

BCS-LH Band Combiner and Splitter–Long Haul module

BER bit error rate

BIOS basic input/output system

BIP bit interleaved parity

BITS building integrated timing supply

BLSR bidirectional line switch ring

BPV bipolar violation

BRI Basic Rate Interface

BW bandwidth

C

CBUS control bus

CCAT contiguous concatenation

CDE Common Desktop Environment

CHAP Challenge Handshake Authentication Protocol

CIR committed information rate

CIT craft interface terminal

Cisco IOS Cisco Internetwork Operating System

Cisco MGM Cisco Media Gateway Manager

CLEI Common Language Equipment Identifier

CLI command-line interface

CLIP Client Layer Interface Port

CM configuration management

CMP Control and Monitoring Processor module

CMP-W Control and Monitoring Processor module

CMP-W-2E Control and Monitoring Processor module–2 Ethernet

CO central office

CORBA Common Object Request Broker Architecture

CPBIT C-bit parity bit

CPU central processing unit

CRS-1 Cisco Carrier Router System 1

CSMA/CD carrier sense multiple access collision detect

CSU channel service unit

CSV comma-separated values

CTP connection termination point

CV coding violation

CV-L line coding violation

CV-P path coding violation

CVP-P coding violation path

CV-S section coding violation

CVS-S section coding violation

CV-V coding violation VT layer

D

dBm decibel referred to 1 milliwatt (dBm)

DC direct current

DCC data communications channel

DCE data circuit-terminating equipment

DCN data communications network

DCS Digital Cross-connect System

DCU dispersion compensation unit

DDS digital data service

DHCP Dynamic Host Configuration Protocol

DLC digital loop carrier

DOS disk operating system

DRI dual-ring interconnect

DS1 digital service 1

DS-1 digital signal level 1

DS3-12 Digital Signal Level Three (12 ports) card

DS3N-12 Digital Signal Level Three (N-12 ports) card

DSL digital subscriber line

DSU data service unit

DTE data terminal equipment

DUS do not send

E

ECR bit error corrected rate

EDFA erbium-doped fiber amplifier

EFD event forwarding discriminator

ELH Extended Long Haul

EML Element Management Layer

EMS element management system

ENE end network element

EOC embedded operations channel

EOI-W External Orderwire Interface module

EP extra pump

ES errored seconds

ESF Extended Super Frame

ES-L line errored seconds

ES-P path errored seconds

ESP-P errored seconds path

ES-S section errored seconds

ES-V errored seconds VT layer

ETSI European Telecommunications Standards Institute

EXZ excessive zeros

F

FC-L line failure count

FC-P path failure count

FCS frame check sequence

FDI forward defect indication

FDL Facility Data Link

FEAC Far End Action Code

FEC forward error correction

FEPM far-end performance management

FM fault management

FRU field-replaceable unit

FT1 fractional T1

FTP file transfer protocol

G

GBIC Gigabit Interface Converter

Gbps gigabits per second

GFP generic framing procedure

GHz gigahertz

GMT Greenwich mean time

GNE gateway network element

GOS grade of service

GUI Graphical User Interface

H

H.248 H.248, also known as the Megaco protocol, is the international standard for media gateway control. Primarily used to separate the call control logic from the media processing logic in a gateway. The device that handles the call control function is referred to as a Media Gateway Controller and the device that handles the media is referred to as a Media Gateway.

HTTP Hypertext Transfer Protocol

I

I/O input/output

ID identification

IDL Interface Definition Language

IEEE Institute of Electrical and Electronics Engineers

IIOP Internet Inter-ORB Protocol

ILMI Integrated Local Management Interface

IM Information Model

IOC-W Input/Output Card module

IOF Inter office facility

IP Internet protocol

IPPM intermediate path protection monitoring

IRBA Infrared-band Booster Amplifier module

IRBA-10G Infrared-band Booster Amplifier–10 Gbps module

IS in service

J

JRE Java Runtime Environment

K

kbps kilobits per second

km kilometer

L

LAN local-area network

LAP low-order aggregation point

LAPB Link Access Procedure, Balanced

LAPD Link Access Procedure on the D channel

LAPS linear automatic protection switching

LCAS link capacity adjustment scheme

LCI local craft interface

LCP link control protocol

LCT local craft terminal

LED light-emitting diode

LEM Line Extender Module

LEM-10G-Mxx Line Extender Module–10 Gbps–B1 Monitoring

LEM-10G-Nxx Line Extender Module–10 Gbps–Normal

LEM-10H-Mxx Line Extender Module–10 Gbps High Output Power–B1 Monitoring

LEM-622-Nxx Line Extender Module–622 Mbps–Normal

LEM-EM-Fxx Line Extender Module–Externally Modulated–Forward Error Correction

LEM-EM-Mxx Line Extender Module–Externally Modulated–B1 Monitoring

LEM-EM-Nxx Line Extender Module–Externally Modulated–Normal

LESB link error status block

LH long haul

LHS left-hand side

LIP Loop Initialization Primitive

LLC Logical Link Control

LOF loss of function, loss of frame

LOH line overhead

LOP loss of pointer

LOS loss of signal

LOSS-L loss-of-signal seconds line

LOT loss of traffic

LSM-W Line Service Modem module

LTE line terminating equipment

M

mA milliampere

MAC Media Access Control

MAN metropolitan-area network

MB megabyte

Mbps megabits per second

MCU Multichannel Unit

Megaco See H.248

MG Media Gateway

MGC Media Gateway Controller

MGM Media Gateway Manager

MGX Multiservice Switch

MIB Management Information Base

MIC Mechanical Interface Card

MTU maximum transmission unit

mW milliwatt

N

NAT network address translation

NCB Network Controller Board

NCP Network Control Protocol

NE network element

NEID network element identifier

nm nanometer

NMA Network Management and Analysis

NML Network Management Layer

NMS network management system

NOC network operation center

NP network partition

NPJC-Pdet negative pointer justification count, STS path detected

NPJC-Pgen negative pointer justification count, STS path generated

NSA non-service-affecting

NSAP network service access point

O

OAM&P Operation, Administration, Maintenance and Provisioning

OECP-C Odd/Even Channel Processor–C band module

OECP-L Odd/Even Channel Processor–L band module

OMG Object Management Group

OOB out-of-band

OOB-FEC out-of-band forward error correction

OOF out of frame

OOS out of service

OOS–AINS out of service–auto in service

OOS–MT out of service–maintenance

ORB object request broker

OS operating system, operations system

OSI Open Systems Interconnection

OSPF Open Shortest Path First

OSS operations support system

P

P protect

PAD packet assembler/disassembler

PAP Password Authentication Protocol

PBIT parity bit

PBX private branch exchange

PCA protection channel access

PDH plesiochronous digital hierarchy

PDI-P payload defect indication path

PDU protocol data unit

PIR peak information rate

PLF Power Line Filter module

PLCP Physical Layer Convergence Procedure

PM performance management, performance monitoring

PNNI Private Network to Network Interface

POH path overhead

POP point of presence

PoS packet over SONET/SDH

POST power-on self test

pots plain old telephone system

PPJC-PDET positive pointer justification count, STS path detected

PPJC-Pgen positive pointer justification count, STS path generated

PPMN Path Protected Mesh Network

PPP MP Point-to-Point Multilink Protocol

PRE-L Pre-Line Amplifier module

PRE-L-IR Pre-Line Amplifier–Infrared band module

PRI Primary Rate Interface

PS perceived severity

PSC protection switching count

PSC-R protection switching count-ring

PSC-S protection switching count-span

PSC-W protection switching count-working

PSD protection switching duration

PSD-R protection switching duration-ring

PSD-S protection switching duration-span

PSD-W protection switching duration-working

PTP Physical Termination Point

PXM1 Processor Switch Module (1.2 Gbps switching capacity)

PXM1-E Processor Switch Module, Enhanced

PXM45 Processor Switch Module (45 Gbps switching capacity)

R

RAI remote alarm indication

RAM random-access memory

RBA Red-band Booster Amplifier module

RBA-10G Red-band Booster Amplifier–10 Gbps module

RBA-10G-E Red-band Booster Amplifier–10 Gbps–ETSI module

RBU Router Bridge Unit module

RDI remote defect indication

REI remote error indication

RFC request for comments

RFI remote failure indication

RHS right-hand side

RIP Routing Information Protocol

RMON remote monitoring

RPM Route Processor Module

Rx receive

RX CVRD code violations and running disparity errors encountered in the receive direction

RX HEC number of CDL header errors encountered in the receive direction

S

SA service affecting

SA/DA service address/destination address

SAM SONET Access Module, SDH Access Module

SAS-L line severely errored frame/alarm indication signal

SAS-P path severely errored frame/alarm indication signal

SASP-P SEF/AIS seconds path

SCC serial communication controller

SCF Subrack Common Functions module

SCL system communications link

SCU Single-channel Unit, Shelf Control Unit module

SD signal deterioration

SDCC SONET data communications channel

SDH synchronous digital hierarchy

SEF severely errored frame

SEFS severely errored framing seconds

SEFS-S section severely errored framing seconds

SES severely errored second

SES-L	line severely errored seconds
SES-P	path severely errored seconds
SESP-P	severely errored seconds path
SES-S	section severely errored seconds
SES-V	severely errored seconds VT layer
SF	signal failure, Super Frame
SFP	small form factor pluggable
sid	system identifier
SLIP	Serial Line Internet Protocol
SMDS	Switched Multimegabit Data Service
SNH	Supervision Network Hub module
SNMP	Simple Network Management Protocol
SNS	Supervision Network Switch module
SNTP	simple network time protocol
SOH	section overhead
SONET	synchronous optical network
SPE	synchronous payload envelope
SPVC	soft permanent virtual connection
SQL	structured query language
SRLG	shared risk link group
SSM	synchronization status message
STP	shielded twisted-pair
STP	Spanning-Tree Protocol
STS	synchronous transport signal
STS-N	synchronous transport signal level N
STU	synchronization traceability unknown
SVT	system verification test

T

TC threshold crossing

TCA threshold crossing alert

TCC Timing Communications and Control Card

TCC+ Timing Communications and Control+ Card

TCP Transmission Control Protocol

TCP/IP Transmission Control Protocol/Internet Protocol

TDS time-division switching

TFTP Trivial File Transfer Protocol

TID target identifier

TIM trace identifier mismatch

TLAN transparent local-area network

TMF TeleManagement Forum

TMN Telecommunications Management Network

TOH transport overhead

TP termination point

TPA transmit power amplifier module

TPA-B Transmit Power Amplifier–Blue band module

TPA-IR Transmit Power Amplifier–Infrared band module

TPA-R Transmit Power Amplifier–Red band module

TSI time slot interchange

TSV tab separated values

TUG tributary unit group

Tx transmit

U

UAS unavailable seconds

UAS-L line unavailable seconds

UAS-P path unavailable seconds

UAS-V unavailable seconds VT layer

UCR uncorrected codeword rate

UDC User Data Channel module

UDP User Datagram Protocol

UI user interface

UPSR unidirectional path switched ring

UTC Coordinated Universal Time

UTP unshielded twisted-pair

V

V volt

VAP VT aggregation point

VC virtual channel

VCAT virtual concatenation

VCI virtual channel identifier

VCG virtual concatenation group

VCL virtual channel link

VISM-PR Voice Inter-working Service Module PRemium

VLAN virtual local area network

VOA VOA attenuation

VoIP Voice over Internet Protocol

VPI virtual path identifier

VPL virtual path link

VT Virtual Tributary

VTB virtual tributary bundle

VTG virtual tributary group

VXSM Voice Switch Service Module

W

W	working
WAN	wide-area network
WCM	Wavelength Converter Module
WCM-10G-Fxx	Wavelength Converter Module–10 Gbps–Forward Error Correction
WCM-10G-Mxx	Wavelength Converter Module–10 Gbps–B1 Monitoring
WCM-10G-Nxx	Wavelength Converter Module–10 Gbps–Normal
WCM-10H-Mxx	Wavelength Converter Module–10 Gbps High Output Power–B1 Monitoring
WCM-622-Nxx	Wavelength Converter Module–622 Mbps–Normal
WCM-EM-Fxx	Wavelength Converter Module–Externally Modulated–Forward Error Correction
WCM-EM-Mxx	Wavelength Converter Module–Externally Modulated–B1 Monitoring
WCM-EM-Nxx	Wavelength Converter Module–Externally Modulated–Normal

X

XC	Cross Connect card
XC10G	10 Gigabit Cross Connect card
XCVT	Cross Connect Virtual Tributary card
XTC	Integrated Cross-Connect, Timing, and Control card

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